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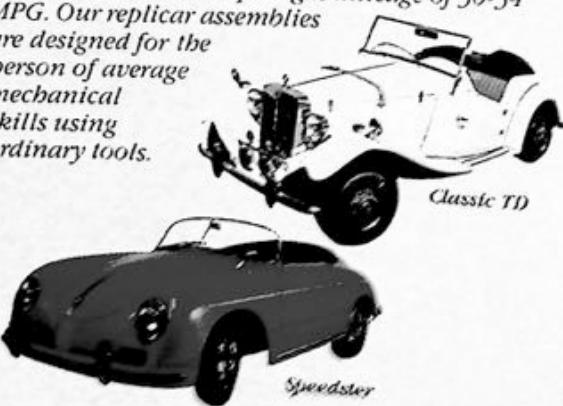


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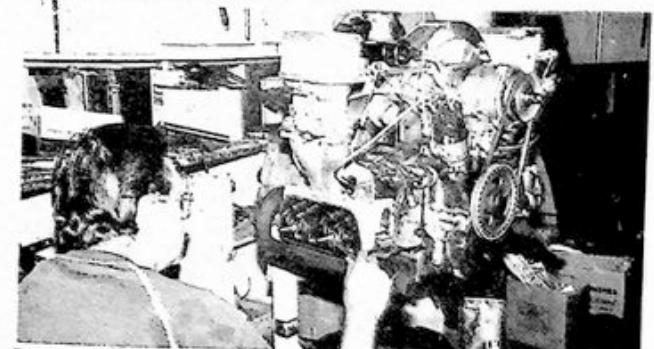
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**ON THE COVER:** Alden Thomas' Peterson GTO has created a new Ferrari legend. Its aggressive road mannered engine is sure to capture the hearts of all Ferrari enthusiasts. See **COVER STORY**, p. 22.  
**PHOTOGRAPH BY STEVE SCHAFFER**

JULY 1986

JULY 1986

# EDITORIAL

## A LIFETIME AFFAIR WITH THE AUTOMOBILE

By Dave Fults



I have loved automobiles for as long as I can remember. From the time I could see over the fender, I wondered what made these things tick. I still recall the first time my father and I went to the neighborhood Ford dealership to see the new 427 Cobra. But it wasn't until my brother and his friends entered high school that my enthusiasm for cars really took off. My fond memories of watching Mark and his buddies work on their cars and trucks will be remembered forever.

There was Randy's '63 Chevy pickup and Dave's orange Jeep CJ. I received my first basic hot rodding lesson on that jeep; it was a camshaft, headers, anifold and carb swap that brought the AMC V8 to life.

My favorite day was when Mark and his buddies decided it was time for me to learn to drive. A dozen guys were on hand and there was a collection of cars to use, yet there was no question about it—they chose the big-block-powered '66 Vette. I could barely depress the clutch pedal, but after a "hard" afternoon's work, I finally got the car around the block without the engine bucking or stalling. I've been enthralled with big-block power ever since.

When I entered high school, I enrolled in auto shop with my friends. But after the first day, when the teacher explained what was planned for the course, I knew this formal setting was not for me. They wanted to begin with the basics—something I had conquered years earlier.

The seed had been planted. I will forever be grateful to my brother and his friends for introducing me to this thrilling sport. I'm sure a large number of our readers were introduced in a similar way. A bunch of guys sitting around a garage with the stereo blasting, grease up to their elbows and each with his own opinion of how to accomplish the job.

My first car was a '68 Dodge Dart GT. I bought it from my brother for \$600 and

it was in pristine shape. If there was any doubt about my lifelong interest in cars, that slant six gem sealed my fate.

Over the years I tried my hand at a variety of branches of the automotive sport. But my first experience with kit cars took place in front of the Petersen Publishing offices. I hadn't been with Petersen very long when I saw a completed Cobra replica in the photo studio. The car was blue with classic twin white stripes and looked terrific. I was impressed, especially since it can be built from the ground up to each individual's specific requirements. Here was the perfect setting for anyone to build his own car right down to the last bolt.

Three years later, I had the opportunity to work on *KIT CAR* Magazine. This was a great chance to experience what I thought was one of the most exciting aspects of hot rodding. The number of cars available astonished me. Even though the Cobra had not caught fire yet, the kit car industry had many different kits to choose from. And these cars were so varied it seemed too good to be true.

Recently, the kit car industry has grown and matured considerably. The products and selection have improved immensely, but a lot of people still have negative opinions of kit cars. They don't understand the industry and most won't bother to investigate it. I believe that if they did, many would change their minds.

The whole concept of this hobby is to enjoy yourself. So those of you who are involved in this sport and interested in its future, please let everyone know that we're building some trick cars and invite them to take a look. As for me, I will continue to help increase enthusiasm in this sport, just as my brother did in the olden days. My son Derek seems to be following the same path I did. At just two years old, he's already showing great interest in his toy cars.

KC

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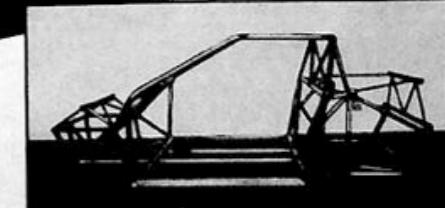
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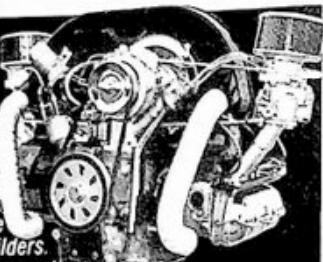
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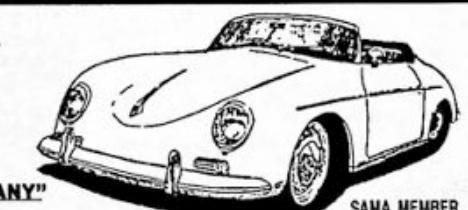
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## LETTERS

### SCHOOL IS IN SESSION

I have been reading KIT CAR Magazine since it began. It was a good magazine when I could only dream about owning a kit car. Now I'm building my second, and I find KIT CAR is even better. My only reservation is that the magazine doesn't feature enough V8-powered cars. I come from the school where there's no substitute for cubic inches... or a good ol' V8! I realize that most readers build and drive VW-based kits, but I am not one of them.

Dan Peller  
Fallon, NY

Dan, what would you call the spread last issue (May '86) on the Sebring 5000 or M&L Automotive Specialties' 427-powered Cobra? Volkswagen-powered cars aren't the only vehicles we feature and certainly not the most prominent in the magazine. Go through your back issues and you'll find plenty of V8s to satisfy your appetite.

### PORSCHE ON PARADE

I couldn't keep myself from telling you how much I enjoyed your Porsche spectacular in the July '85 issue. It was terrific! It's great to be able to see, through your magazine, the machinery that's out there. I owned an authentic Spyder long ago, and regret selling it. I'm now planning to purchase a Beck 550 Spyder and turn it into the ultimate weekend fun-mobile.

Stephen Putsche  
Chino, CA

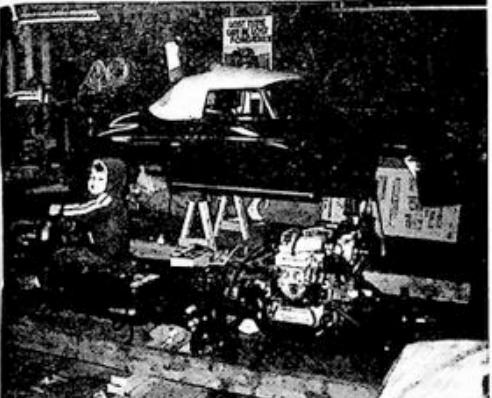
### WHAT COMPETITION?

Great! That's all I can think of to describe your magazine, which I have been reading since '83. I recently picked up one of your competitor's magazines and believe me, there is no competition. You seem to be impartial when selecting articles and don't favor any particular type of car. Also, the way your magazine caters to the low-buck car enthusiasts, like myself, is genuinely appreciated. Keep up the good work!

Stanley Deloney  
Gainesville, FL

### BACK ON THE ROAD

Below is a photo of my second kit car project in progress. After a considerable amount of research, I selected the Intermeccanica Porsche Roadster. I must confess that Frank and Paula Riesner of Intermeccanica were very helpful. Their experience and good salesmanship convinced me to put my 10 percent down, and four months later, one of the most complete kits I've ever seen arrived. To my dismay, however, I



discovered that my Corvair engine would not fit. On the advice of Frank Riesner, I contacted Chris Walsh, an Intermeccanica Porsche Roadster owner. Chris' car was featured in KIT CAR some time ago. His experience was overwhelming, and I appreciated his enthusiasm and assistance enormously. I decided to order a 2-liter VW engine from Cargem. The car is coming together smoothly now and I expect to have it completed and the new car "bugs" worked out by this summer.

Gary M. Budzak  
South Holland, IL

### FRESH START

I am 15 years old and an avid kit car enthusiast. I plan to buy a kit car in a few years and wonder if you have any suggestions on what kind of car I should start with?

Alfred Bhada  
Costa Mesa, CA

Well, Alfred, the biggest problem for young kit car enthusiasts is money, or lack of it, as this can be an expensive hobby. For a first-time project, stick with a kit that's relatively simple and straightforward. Moreover, choose a kit that really turns you on so that you will stay interested. Also, pick a popular brand from an established company, one that's sure to be around if you need help during the construction phase. And remember, a little dedication will go a lot further than a lot of cash!

### A "D" CUP?

I've been looking for a protective front bra for my Magnum GT for some time, but have been unable to locate one. Could you tell me who manufactures them?

Nelson Taylor  
San Bernardino, CA

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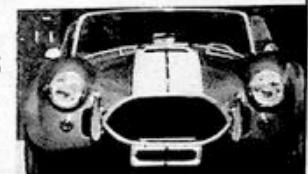
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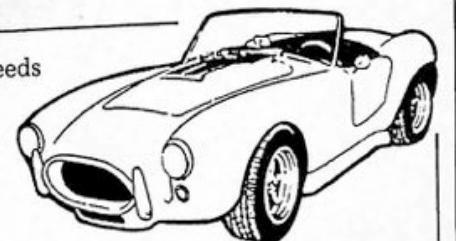
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### LETTERS

automotive upholstery shop custom make one for your application. One shop that comes to mind is Quality Auto Upholstery at 18909 Valley Blvd., Dept. KC, Bloomington, CA 92316, (714) 877-1061. This shop has a reputation for superb craftsmanship, so check it out.

### STAR-STRUCK

What does it take to get a car featured in your magazine? I have just finished a Classic Roadsters, Ltd. Duchessa that I feel merits appearing in your magazine. It has been lovingly assembled and possesses many extras that make it a real head-turner. To see it in your magazine would be a dream come true. Also, how may I obtain a KIT CAR license plate?

Wade Griffin  
Scottsdale, AZ

To consider your car for the magazine we first need photos and information. We'd like to see a series of photos showing front, side, rear and overall views as well as engine and interior shots. Also, we'd like to have a written rundown of its technical features—engine size, suspension type, and so forth. Send this information to KIT CAR, Attn: feature editor, 8490 Sunset Blvd., Los Angeles, CA 90069. If we like what we see, we'll have one of our staff photographers or a local freelance photographer contact you. The only way to get a KIT CAR license plate is to have your car featured in the magazine.

### PINTO BEANS

I am the proud owner of a Pinto-powered MG-TD replica. Many of the kit cars you feature are powered by Ford four-cylinder engines. Are there many aftermarket high-performance parts available for these motors, or a shop specializing in them? My engine is stock right now, but I would like to modify it for better performance.

Tom Yerman  
Ventura, CA

A variety of the more common bolt-on parts, such as headers, intake manifolds and carburetors, are readily available for the Pinto engine from many of the larger high-performance parts manufacturers. Esslinger Engineering, 712 Montecito Drive, Dept. KC, San Gabriel, CA 91776, (213) 289-3073, specializes in Pinto powerplants. Esslinger stocks a huge selection of go-fast goodies and has a knowledge of the Ford four-cylinder that's second to none.

### SEARCHING

I've been reading your magazine for a few years now and am curious if you know of an IMSA-style fiberglass kit for the Datsun B-210 hatchback. I remember reading about it back in '77 or '78 in either CAR CRAFT or HOT ROD Magazine. I realize it's a vague description, but that's all the info I have.

Gregory Thomson  
Philadelphia, PA

D.J. Enterprises in Canoga Park, California, was the original designer and manufacturer of the Datsun B-210 styling kit you speak of, but unfortunately is no longer in business. However, the molds are in the hands of Mike Douglas, P.O. Box 34154, Indianapolis, IN 46234, who is currently re-manufacturing and selling the five-piece fiberglass kit.

### ONE FOR US

When it comes to letter writing, I usually have better things to do. But I just had to let you guys know that your technical articles and especially T.A. Sunderland's column are of great interest to me. I haven't seen any other kit car magazine worth buying for anything other than pictures. And although I don't get too carried away with photographs as such, KIT CAR's photography is far better than anything the competition has to offer. In terms of the How-To variety, KIT CAR is usually tops.

I have watched your publication change and diversify since the beginning. I still can't understand why some people whine if every page of every issue isn't covered with material in their own area of interest. You guys are doing a fine job, keep it up!

Stanley Howard  
Lewiston, ID

KC

Letters published in KIT CAR reflect the opinions of their writers, and do not imply the endorsement of the magazine. All letters should be directed to KIT CAR Magazine, 8490 Sunset Blvd., Los Angeles, CA 90069 and should include the writer's name, address and phone number. We reserve the right to edit and/or condense letters for clarity, brevity or other purposes.

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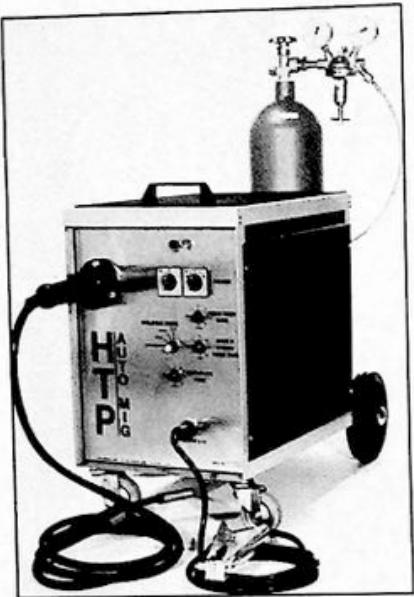
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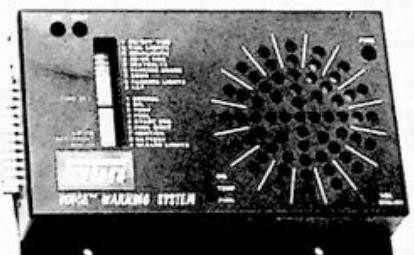
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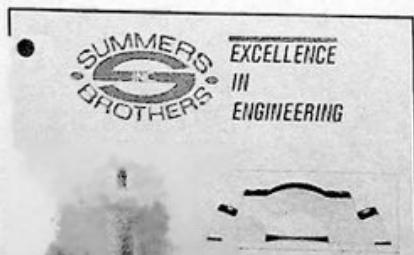
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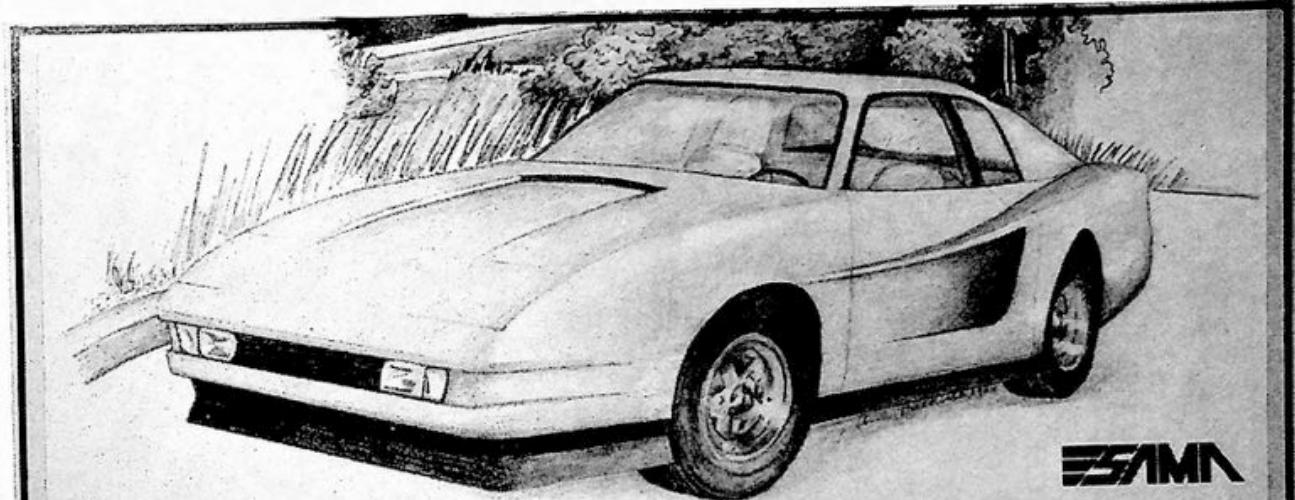
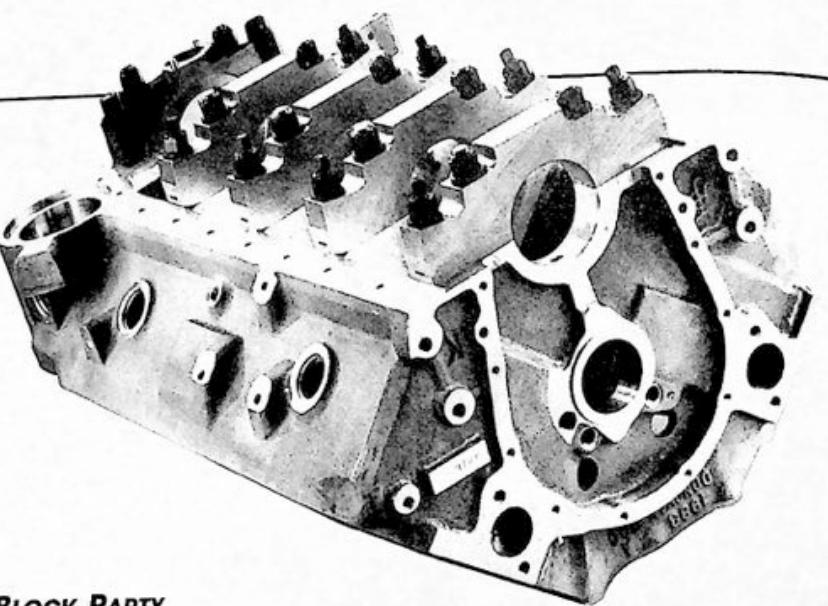
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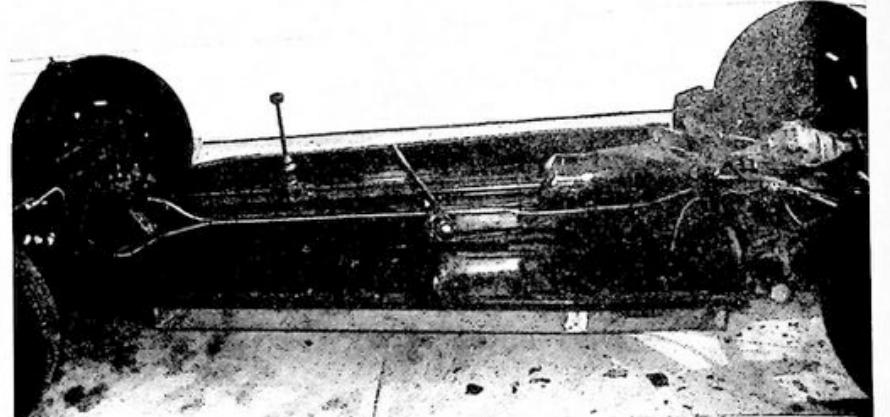
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The products listed in "Product News" are those which the editors feel are of interest to our readers. All specifications and claims are supplied by the manufacturers or sellers, who bear responsibility for their accuracy. It is impossible for KIT CAR Magazine to obtain samples of all products featured for evaluation and verification of manufacturer's claims. This listing is provided as a free service, and vendors are invited to submit information and black-and-white photos for consideration.

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## A DISCUSSION WITH GIL LONGNECKER

By Bob McClurg

It was just a little more than four years ago that Redmond, Washington, kit car builder Gil Longnecker captured the hearts of neoclassic specialty car buffs with his 540K. Since then, Longnecker and his crew at Thoroughbred Motorcars have been improving and refining the breed.

Recently, the company has taken a radical departure from its neoclassic kits, and is now marketing a replica of the rare and exotic Mercedes-Benz 300 SLR race car. Thoroughbred Motorcars

is a family affair. Gil is in charge of the operation, his wife Shirley handles the office and son Jeff runs the shop.

Earlier this year, we were able to tear Gil away from his busy schedule long enough for him to share his thoughts about his company and the kit car industry.

**KIT CAR:** Gil, you've been one of the leading neoclassic producers in the specialty car field with your 540K. Is this how you entered the industry?

**LONGNECKER:** This year, we're celebrating our 10th year in the business. We started by reproducing Volkswagen body parts in fiberglass. Then we went to dune buggies, and from there we began marketing a little European-style, two-seat roadster before developing the 540K. I guess with 10 years under our belt, you might say we're one of the surviving pioneers in the industry.

**KIT CAR:** Have you always been a car enthusiast?



**LONGNECKER:** Yes, from the time I was in high school. I was one of those kids who was happy dechroming cars and lowering anything I could get my hands on. So customizing cars is my background. I also have an interest in both classic and imported cars. I fell in love with early sports cars long before I could ever afford to own one. They've always had a great influence on me, which I guess is obvious when you look at the 540K and 300 SLR.

**KIT CAR:** Give us a little background on yourself.

**LONGNECKER:** After finishing school, I went into the mobile home and modular housing business. First I was a mobile home dealer, then I got into the manufacturing end of it. Eventually I designed a modular housing system that gave me a lot of experience in production. After a few years, though, I decided I had had enough, so I sold my business in Colorado Springs, Colorado, and moved to the Pacific Northwest.

I got into the kit car business by a fluke. My son Jeff was taking a class in high school called "Power Mechanics." He and I became involved in a number of mechanical projects, one of which was building a dune buggy. When we received the kit from the manufacturer, I

**"I FELL IN LOVE WITH EARLY SPORTS CARS LONG BEFORE I WAS ABLE TO AFFORD ONE."**

was appalled at its quality. I said, if this is state of the art, I can do better! I guess that was the beginning of Thoroughbred Motorcars.

**KIT CAR:** What inspired you to build a 540K replica?

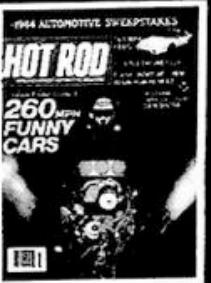
**LONGNECKER:** At the time, I was involved in producing a two-seat sports car called the Tiger. Our customers kept asking us to make the car bigger, to put roll-up windows in it, to make it a four-seater and to make a hardtop. We would have had to redesign the entire car, which would have ruined it.

I've always admired the classic design of Mercedes-Benz's 500 to 540 series. I felt that if this car could be successfully replicated, we would be able to satisfy all of the customer requests in one neat package. I was lucky enough to interest Ken Nelson in the project. Ken had recently retired as a design specialist with Ford of England, and moved to Seattle, Washington. I can't give enough credit to both Ken and fabricator Pete Morley. Without either of these men, the 540K might not have become a reality.

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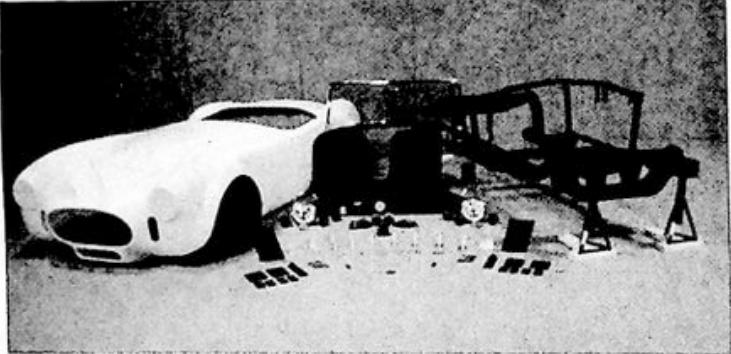
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### INTERVIEW

**KIT CAR:** So the 540K two-seater was your first commercial kit?

**LONGNECKER:** Yes, that car took two years to build. It was a genuine labor of love.

**KIT CAR:** Have you been able to develop a profile of the typical 540K buyer?

**LONGNECKER:** A variety of people buy our cars. I've noticed that a lot of our customers are airline pilots. Doctors also seem to prefer our cars. In fact, there's a doctor in Seattle who drives his 540K to his condo in Palm Springs, California, a couple of times a year. His wife says he likes driving it better than his Mercedes or Cadillac.

**KIT CAR:** Jack Boehning's award-winning 540K has obviously helped gain public recognition for your car. Has it helped stimulate sales?

**Editor's Note:** Jack Boehning's 540K was awarded KIT CAR Magazine's "Best of Show" trophy at the third annual SAMA-sponsored Kit Car Nationals held last July in Detroit, Michigan.

**LONGNECKER:** Absolutely. Jack's 540 is shown on the ISCA Show Car circuit where there are a lot of people who have never seen a kit car before. Jack has proven that you can take a well-designed kit and turn it into a beautiful car.

**KIT CAR:** So much for the 540K. Now you're off on another project that is sure to excite a lot of people. Tell us about the 300 SLR.

**LONGNECKER:** We saw the Alex Walk prototype at the SAMA show in Detroit. I had been looking for a companion car for the 540K and just fell in love with this SLR. It is so well done it's like we designed it ourselves. First of all it's a replica of a Mercedes-Benz, which we're known for. The 300 SLR also has a one-piece body like our 540K, which, of course, makes a car stronger and easier to assemble. The idea that we would build our own chassis also appealed to me, and the car uses the same reliable Ford drivetrain components that we use

**"WE'RE INTERESTED IN  
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in the 540K. It fits in our product line in so many ways. Another thing I liked was that the 300 is a replica of a very rare car, as is the 540K. I think only 10 or 11 of these cars were built; and Mercedes-Benz never sold any of them. A replica of such a rare car is very prestigious. You don't have to worry about seeing too many of them around. In fact, the only 300 SLR available west of the Atlantic is on loan from Mercedes-Benz to the Henry Ford Museum in Dearborn, Michigan.

The 300 SLR replica can also go head to head against the Cobra replica in the marketplace. Currently, there are some excellent mid-Fifties sports car replicas available, and I think the 300 SLR is one of them. We at Thoroughbred Motorcars are interested in building replicas of cars that you can't obtain any other way.

**KIT CAR:** Now that you have successfully bridged the gap in the marketplace with both a neoclassic and a sports car, how do you plan on promoting both?

**LONGNECKER:** We're becoming a lot more aggressive. Until now, I guess you could say that our cars sold by word of mouth. When we received requests for literature, we referred the person to a customer in his area who had built one of our cars. From there, the product usually sold itself. But now, we've hired a sales manager, and we'll be doing a lot of trade shows and other projects.

**KIT CAR:** Gil, your son Jeff is very involved in the business. Has this been beneficial to the growth of the company?

**LONGNECKER:** Jeff grew up with the business. He's really taken a keen interest in the company. He runs our production shop and has contributed a lot of creative ideas pertaining to the marketing, production and advertising aspects of our products. Between going to college and working here, he keeps pretty busy.

**KIT CAR:** Are you a supporter of the manufacturers' trade association concept to help govern the kit car industry?

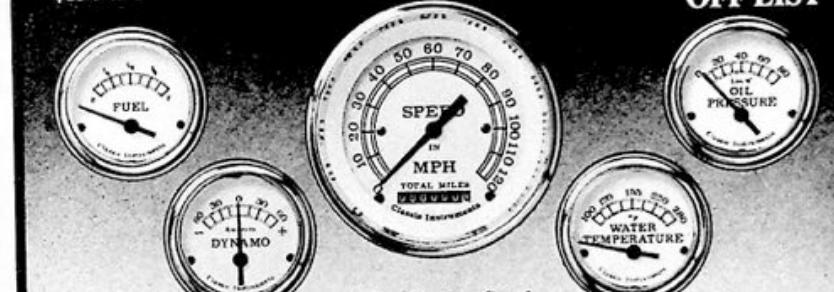
**LONGNECKER:** I feel that the industry is in a maturing state. There is an evolutionary process going on where the marginal manufacturers are slowly being weeded out. The customers now demand better products, and the industry must become more professional. One way to do this is by getting involved with other manufacturers to protect mutual interests, and help the industry as a whole.

**KIT CAR:** Right now, the question of government involvement in the industry is a hot topic. Care to share with us your feelings on that?

**LONGNECKER:** I feel it would be a mistake (for the government) to make it impossible for there to be another Henry Ford. That's what can happen when too many stringent regulations are placed on a small industry. You don't have an umbrella of protection for the little guy. The kit car industry is where many new ideas form, and it's a business where the little guy can start out on a shoestring, produce a good product, and make something of himself. I'm in favor of the government giving exemptions to smaller businesses, providing they meet certain baseline standards. The kit car industry should be nurtured rather than starved by unreasonable government regulations!

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# KIT CAR SCENE



## COB IN A BOX

It should come as no surprise that many English companies manufacture aluminum Cobra replicas, as the originals were only highly modified, English aluminum-bodied sports cars. Gravetti Engineering Limited (Units 2D-3C, Quarryfield Industrial Estate, Mere, Wiltshire, England BA12 6LA) has been manufacturing Cobra reproductions for quite some time, and has offered aluminum bodies as an option for more than two

and a half years. Gravetti's kit utilizes the same components as the exotic Cobra reproductions, which include Jaguar suspension parts, four-wheel disc brakes and full-leather interior. The "Cob in a box" package is an excellent system for the serious enthusiast who wants a no-holds-barred Cobra replica. Plans to market Gravetti's Cob in a box kit and aluminum bodies in America are in the works.



## WHAT, ME WORRY?

Former KIT CAR Magazine editor Bob McClurg hasn't slowed his pace since entering the harrowing world of free-lancing. Case in point. From the week of March 14 to March 22, 1986, Bob took a one-day trip to Washington, D.C. on Friday the 14th to appear on a 10-minute specialty car segment for "CBS News Nightwatch," then the next day he helped stage the First Annual Eloy Gran Prix/Budweiser Car Show and Concours in Eloy, Arizona, and he topped the week off by tying the knot with photojournalist, Barbara Elaine Reyes the following Saturday.



## UNLIMITED CLASSICS

Ed and Becky Saunders at Classics Unlimited (515 Woodlawn Ave., Owosso, MI 48867) specialize in kit cars from Classic Roadsters' product line, but will assist with or build any kit for a customer. The firm's entry into the kit car construction business was inspired by Becky, who convinced Ed that it would be a good venture for them. Feel free to give either Ed or Becky a call at (517) 725-6517.



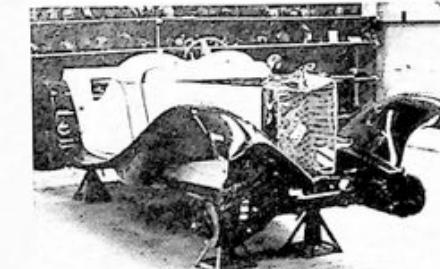
## HOT ROD GOES KIT CARS—AGAIN

Last year, Petersen's flagship magazine HOT ROD featured two kit rods including Magoo's fiberglass-bodied street rod and the building of a Speedway Motors lowboy. The results were outstanding. This year will be even better. The June 1986 issue features three kit cars on the cover—Beck's 550 Spyder replica, North American Fiberglass' 427 Cobra replica and CRE Enterprises' Track-T. Inside you'll find informative articles including a complete buyers' guide, road tests and a wealth of tips for the prospective kit car builder. These features will help enlighten newcomers to what our sport has to offer, and is good reading for current and soon-to-be kit car enthusiasts.



## THE SHOW MUST GO ON

One of Contemporary Cobra's most aggressive dealers, Ron and Kathy Russell's R.A.C.E., Inc., recently staged its annual Cobra open house at the Russells' spacious Diamond Bar, California, facility. The weather wasn't too kind to the Russells, but a little rain (more like a deluge) didn't dampen their enthusiasm in the least. They just cleared out their six-car garage (including the family's new Corvette) and held the show inside. There were six Cobras at the affair and about 100 folks who sampled Kathy Russell's award-winning chili.



## CLASSROOM CLASSIC

The auto mechanics classes of Stearns High School in Millinocket, Maine, have joined the ranks of America's kit car builders. Merton Rivers, Stearns' automotive instructor, purchased a Classic Roadsters Duke kit from Kit & Kaboodle in Orono, Maine, and enlisted the members of his auto shop classes to assist in the car's construction. The project began with the disassembly of a 1974 Mustang II donor vehicle. Every component was either rebuilt or reconditioned before installation. The Ford V6 engine was treated to a new performance camshaft, intake manifold and four-barrel carburetor. At last report, the project was moving along nicely with only the wiring, lights and interior installation remaining. We can't wait to see the results.



## GHIA SPEEDSTER

Fiberglass Specialties (Rt. 8, Box 400, Stones Landing, Montgomery, TX 77356, 409/588-4117) announces the release of the James/Stone Speedster styling kit for VW Karmann Ghias. The conversion is available in a simple, three-piece fiberglass kit and fits any Ghia, both hardtop and convertible. It features a one-piece front clip that is bonded to the existing sheetmetal. Two rear fender skins are attached in the same manner as the front clip. All stock wiring, lights and related hardware can be retained in the conversion. This kit is perfect for the first-time builder, and quickly transforms any stock Ghia into a real eye-catcher. Price for the James/Stone Speedster kit is \$1995. KC

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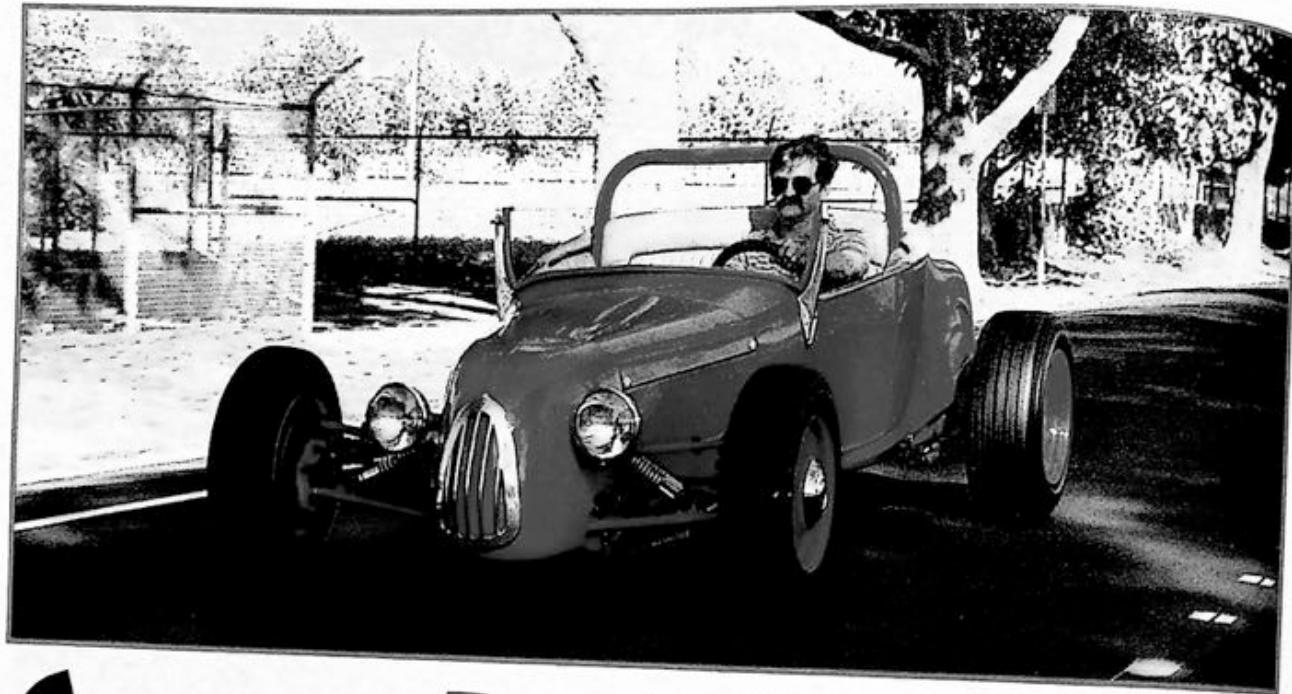
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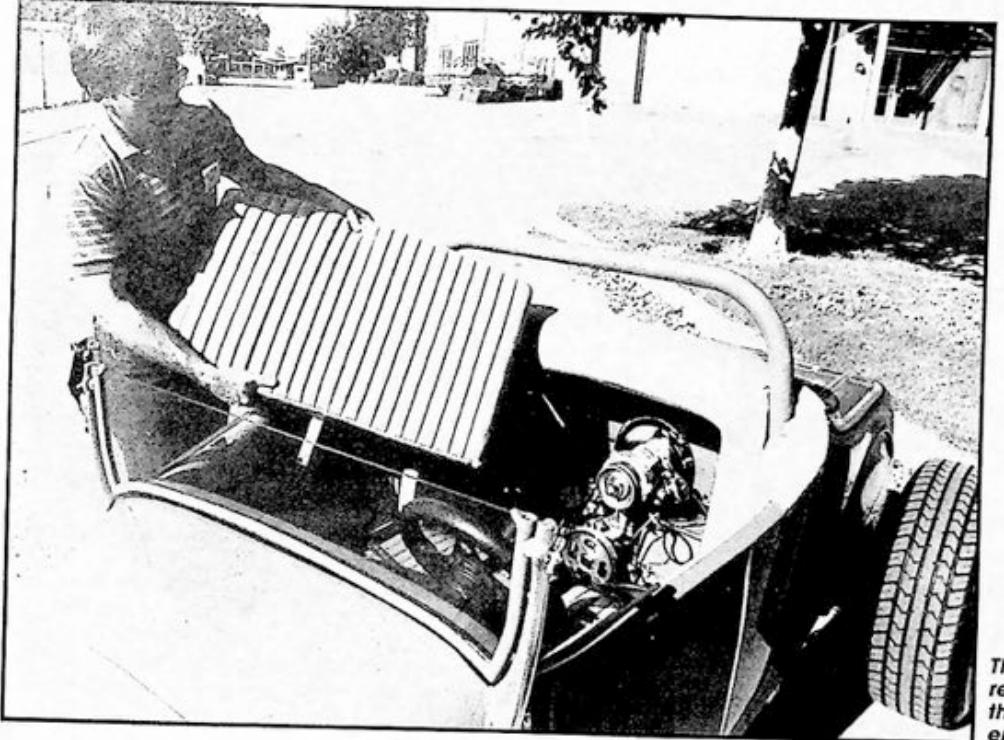


# Seeing Red On Ave. T

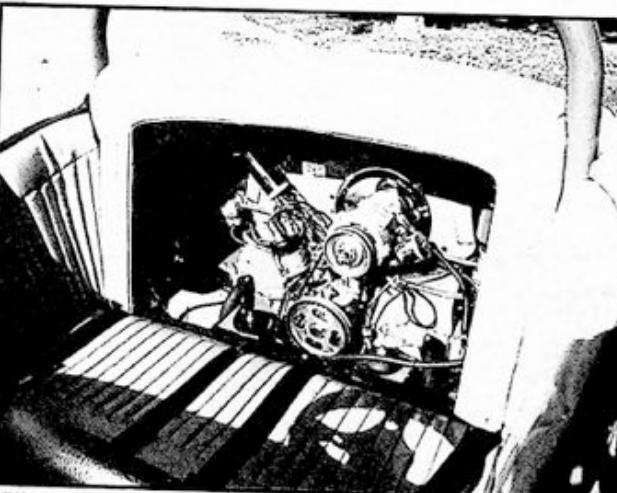
**IT BEGINS AND ENDS WITH AVERRE HOT ROADSTER**  
By Peter W. Frey



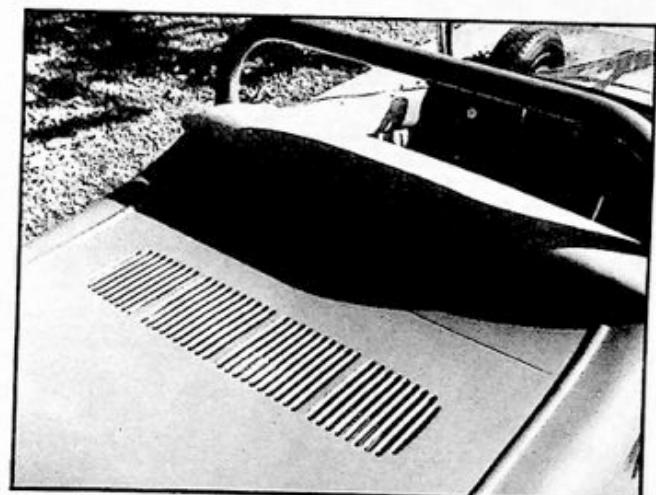
Traditional American Track-T undergoes a bit of European transformation in the hands of Phil and Steve Averre. VW power is unusual but ensures lots of fun for the buck. At rest or cruising down a tree-shaded lane, the Averre Track-T does what it does best—turns heads and makes people smile.



*The Averre Track T has a removable seat back that makes access to the engine infinitely easier.*



*With the cover removed, notice what direction the engine is facing. That's right fans, the Averre Track T is mid-engined—sort of, anyway.*



*Any air-cooled engine needs a steady flow of cool air and an opening to exhaust the hot stuff. Handling this on the Track T is a set of slots in the top of the turtleback body section.*

**S**OMETIMES IN THE evolution of a kit car, from idea to reality, fate takes a hand. So it was with the Averre track roadster—the creation of brothers Phil and Steve Averre.

Phil put his first metric wrench to a VW when he was 14 years old. That wrench-to-bolt contact has shaped the lives of he and his brother. Today, instead of going their separate ways, they run a VW parts store and wrecking yard in Longview, Washington. In their spare time, Phil and Steve create some radical machinery... Volkswagen-powered machinery, of course.

"Our track roadster began to take shape when Phil bought the nose section and grille from a company called Speedway," recalls Steve. "He saw it and knew at once that someday we'd build a car around it. Since we make our living buying and selling VW parts, this kind of project was a natural for us."

And a successful one at that. The brothers make a point of attending all the VW events in the Pacific Northwest area where the car has been a sensation. They even ventured into the tough California show scene and received a "Best Kit Car" award at the May 1985 Bug-A-Rama event in Sacramento.

This prestigious honor led to the creation of a 2x3-inch rectangular tube frame, after Phil purchased the nose and grille. Built by an outfit called Abernathy Creek Machine, the frame has a 106-inch wheelbase and has mounting points for a variety of hardware.

The custom-made front suspension is patterned after the one that was used on Indy cars in the mid-'50s, with Harley-Davidson shock absorbers for a smooth ride. A 1979 VW Rabbit rack and pinion steering is used, with spindles, front discs and rear drums from a 1969 Type III VW. The tubular A-arms in front were built by Abernathy Creek Machine using

## Seeing Red On Ave. T

Type III ball joints. In back is a standard 1967 VW Beetle suspension setup, stock shocks and torsion bars.

Holding up the chassis is a combination of wheels and tires that would make any purist livid—15x5.5-inch Kelsey Hayes wire wheels with 145x15 Michelin radials in front, and a set of 15x8-inch McLean wires and 245-60/15 Riken tires in back. The unifying factor in this odd but handsome assortment of components is a set of early Ford stainless steel hubcaps.

The engine under the neatly styled turtledeck rear bodywork originated as a 1972 VW motor displacing 1776 cc. Not content with the performance of this stock engine, Phil and Steve had it bored and stroked to 90.5x69 millimeters, installed a hotter cam (465 lift, 288 duration), fitted it with Crane valve springs and a pair of 44 IDF Weber carburetors. Also included is a set of 90.5 forged pistons, Truehaft ignition system, ported and polished heads with oversized valves, counterweighted crankshaft, deep-sump oil pan and a set of custom-built 1.5-inch-diameter tube headers. All work, including balancing, was done by Jon Martin of Castle Machine and the ever-present Abernathy Creek Machine.

Power from this potent mill is transmitted to the rear tires via a rebuilt 1967 VW Type I transaxle, nine-spring clutch from a VW bus, and topped off with a Hurst shifter. Air-Cooled Automotive modified the transmission with a 4.10:1 ring and pinion and "Beef-A-Diff" kit.

Giving all this mechanical wizardry an eye-catching quality is a fiberglass replica of a 1927 Ford Model T

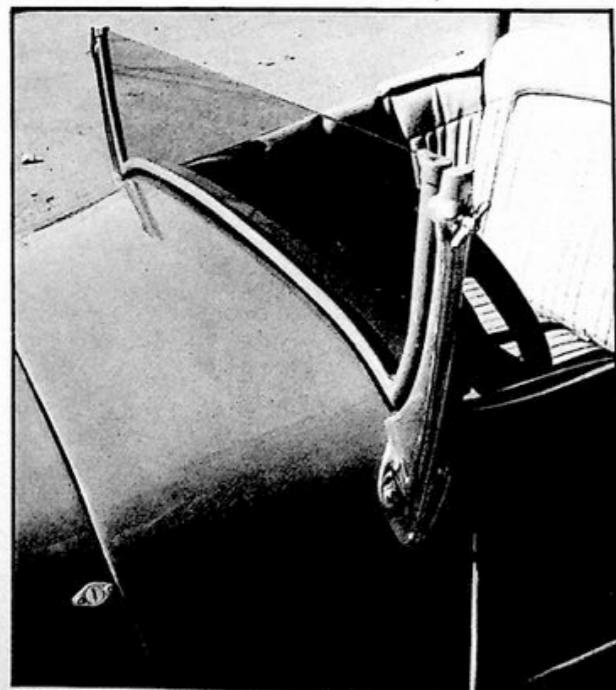
body painted with GM Crimson Red acrylic enamel. The look of the car is further distinguished by "King Bee" headlights and taillamps from a 1939 Ford. Body and paintwork was done by Al Wilson.

Maintaining the same level of quality, the upholstery was done by Jim's Auto Upholstery (4002 Ocean Beach Hwy., Longview, WA). It's finished off in biscuit-colored Naugahyde. The gauges are VDO "Night Design" units, the burley maple custom dashboard by King Kraft, and the tidy, professional wiring courtesy of Ty Hill.

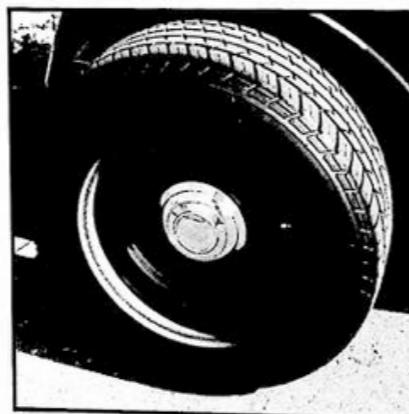
Building the "Ave. T" track roadster took 47 days and involved the talents of those previously mentioned, as well as Fred Smith and Ron Hormann. When completed, Phil and Steve Averre put their creation through performance testing and made the following claims. At 4000 rpm in fourth gear, the car cruises smoothly at 110 mph. At 50 mph braking distance is less than 50 feet. And not only does the car look great, go fast and turn heads, it averages 26.7 mpg.

"We only drive it when the sun shines, which may account for why it only has 654 miles on it so far," adds Phil. "Future plans necessitate the installation of a blower, which should raise the performance level of the roadster out of sight. Still, with all its capabilities, the Ave. T is basically a VW-based kit car, which makes it easy to repair, inexpensive to modify, and definitely fun to drive. If everyone had a car like this, you'd see a lot more smiling people," Phil speculates.

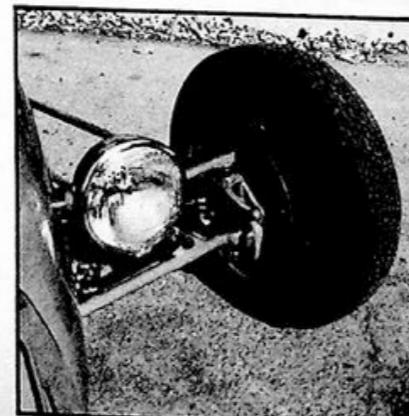
The brothers Averre aren't in the business of building kit cars for sale to the public, but chances are that if you contact them at their shop (4510 Ocean Beach Highway, Longview, WA 98362, 206/425-1119), they'll supply you with whatever you need to build your own red "smile generator." KC



Notice how neat every aspect of the car is ... even down to the windshield mounting hardware. And no rear-view mirrors.



This unlikely combination of wheels and tires seems as though it couldn't possibly work, but it does—both functionally and aesthetically.



Notice the front suspension hardware which, though VW-based, definitely has an American '50s look, except for the use of huge disc brakes instead of huge drums.



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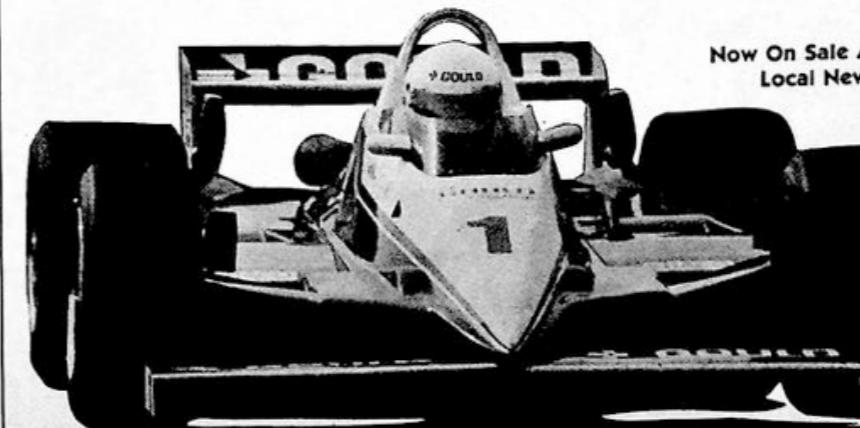
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## Seeing Red On Ave. T

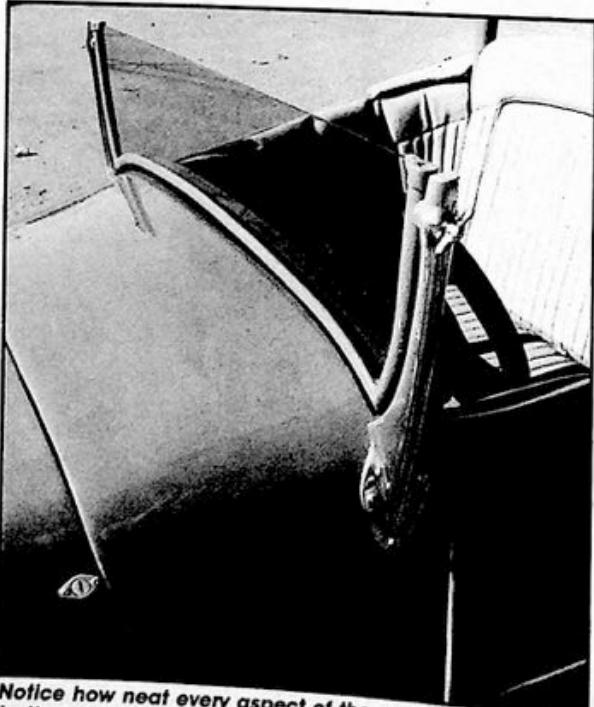
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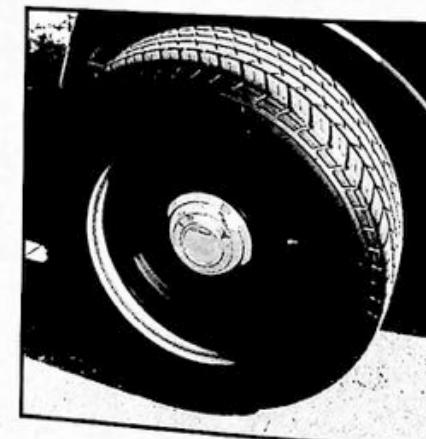
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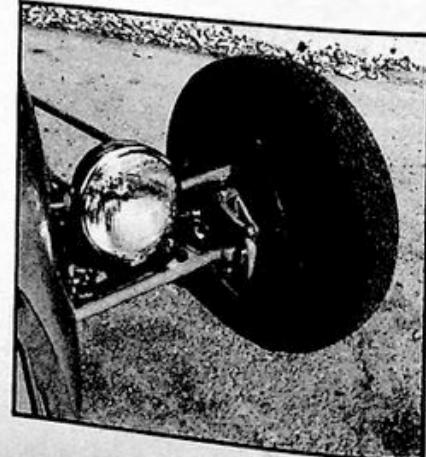
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# EUROPEAN CONNECTION

## 250 LM—UNPRETENTIOUS AND APPEALING

By Andy Willsheer



Although the notion of fitting a replica Ferrari body on a mundane Volkswagen pan may seem a little incongruous, there's no denying the visual appeal of the hybrid example shown here.

Based upon the Le Mans Berlinetta model of the early Sixties, the 250 LM replica's dimensions are elongated to accept a 2+2 configuration, but the end result is not a far cry from the original's lithe lines. Okay, so fans of the prancing horse marque may scoff at this impudent impersonator, but there's no pleasing everyone!

This kit has been available on the UK market for almost four years and while the component-form prototype was designed with the ubiquitous VW air-cooled flat-four in mind, this particular version combines Porsche power with an appropriately modified chassis.

The basic kit includes a one-piece 'glass bodyshell (supplied part-trimmed in whichever gel-coat finish the customer requires), doors, hood, sliding side windows plus trunk lid already fitted. All bolt holes are pre-marked on the body, which is mated to the donor Bug floorpan at

the stock mounting points.

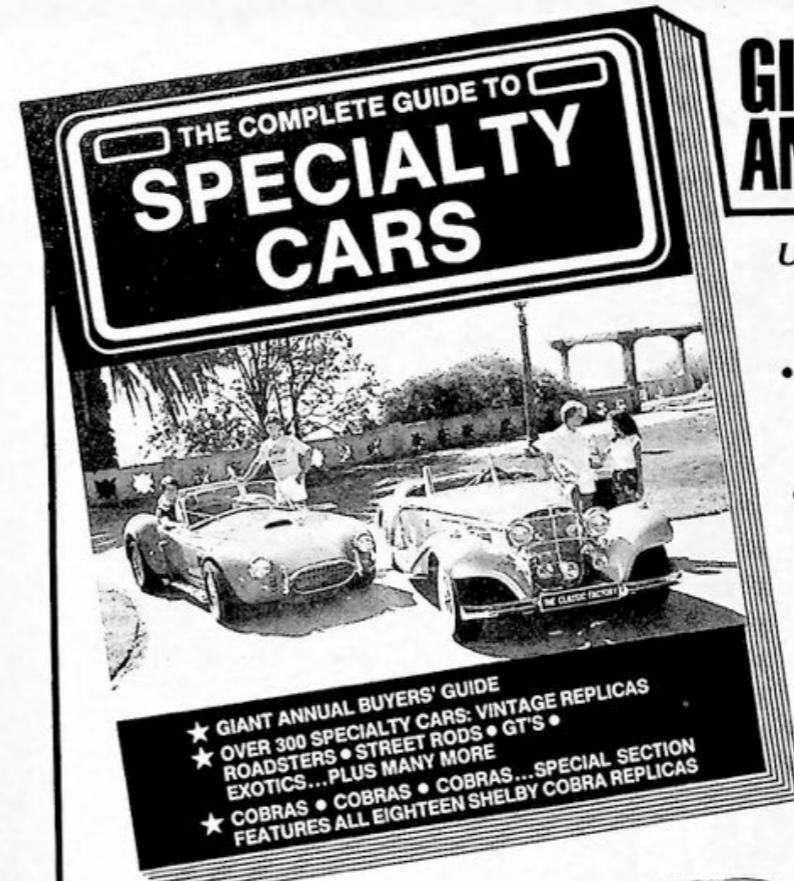
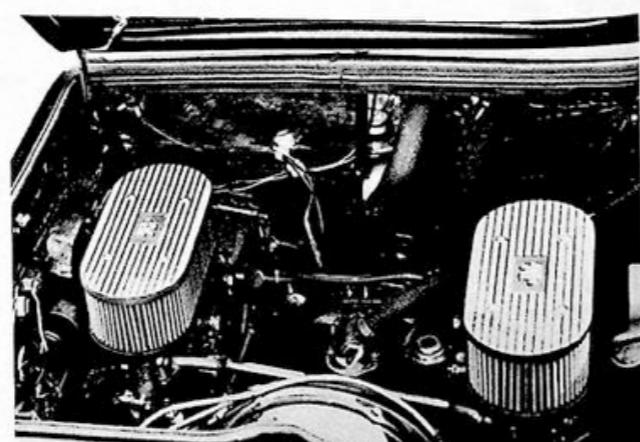
Offered in two more-advanced stages of completion and even in turn-key form, this fake Ferrari combines practicality with ease of construction for those kit car enthusiasts who like to take the do-it-yourself route.

The raucous red demonstrator proved to be a lively performer on the narrow, winding country lanes surrounding the small manufacturer's premises, though on a long journey the accompanying noise intrusion could become a little wearisome.

Entry and exit from the low-slung vehicle is easy for front seat occupants, but medium-sized passengers intending to sit in the back must be contortionists. A modicum of luggage space is available up front but baggage can also be stashed on the seats in a squeeze. The addition of an under-dash parcel tray wouldn't be a bad idea either.

Price of the 250 LM kits vary between \$2600 and \$5000, with factory-built versions commanding a premium of about 50 percent above the latter figure. A Rover V8-engined version is also available and interested parties can obtain further information on the 250 LM variants by contacting Peter Bernthal at:

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Dedham,  
Colchester,  
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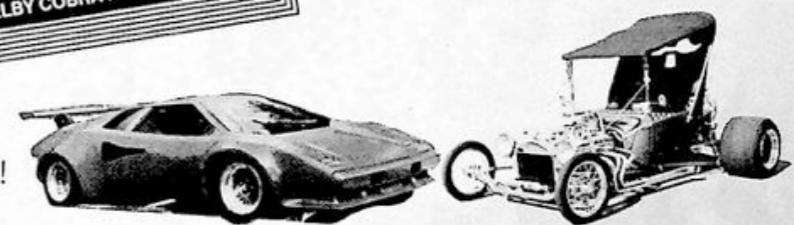
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# PREHISTORIC



## KIT CARS

**BILL DEVIN: A TALE OF LEGENDS LOST AND CARS BEFORE THEIR TIME**

By Peter W. Frey

**L**ONG BEFORE THERE was a Carroll Shelby, there was a Bill Devin. His name may not be as familiar as Shelby's these days, but while Shelby was still day-dreaming of the car that would ultimately change automotive history, Devin was already on the market with a super-lightweight, high-powered, two-seat sports car—the Devin SS—that was the envy of every car freak in America and would blow the doors off just about anything else that was available at the time.

Too bad his timing was so lousy. Had Devin waited 10 years to pull his fiberglass rabbit out of the hat, things might have turned out considerably different.

The year was 1953. The post-World War II technology boom had brought fiberglass out of the laboratory and into the marketplace, and Devin was building boats out of it... a lot of

boats. Enough boats, in fact, that he could afford to travel to the Ferrari factory in Maranello, Italy, pick out a new chassis, draw a rough sketch of the body he wanted on the back of an envelope, and hire the famed coachbuilder Scaglietti to build it.

Legend has it that Dino Ferrari, son of the Commentadore himself, saw the car and was so taken with its flowing lines that he used the shape as the basis for the then-new four-cylinder Monza roadster. The Monza begat the Mondial, which went on to become one of the most desirable of the '50s Ferraris, and served to influence the styling of an entire generation of sports cars, including the famed Reventlow Scarabs.

Whether there is any truth to the legend or not, it is a fact that when Devin got the car back to his boat works in El Monte, California, he had a

mold made of the aluminum Ferrari body, produced a fiberglass replica, and began the process of transforming himself from a well-to-do boat builder into the father of the modern kit car.

Too sweeping a judgment? Perhaps. Are we ignoring others who played major roles and are equally deserving of mention? Certainly there were a great many innovators and enthusiasts who contributed to the evolution of the kit car (and we will tell their stories in upcoming issues), but Devin was the first to bring production-based engineering and design to a field that was populated largely by backyard tinkerers with delusions of grandeur.

Consider. Up to the point when Devin threw his efforts and resources into the process of creating a state-of-the-art kit car, most vehicles on the market were crude, half-finished fiberglass shells that required the

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talents of a master fabricator to turn them into finished products. Devin was the one who researched the kit car market and realized that the enthusiasts who built them were likely to use any one of a variety of chassis for their creations. But for a manufacturer to create molds to fit all the various width and wheelbase scenarios was financially prohibitive.

So Devin created a modular mold with sections that could be added or removed to adapt the dimensions of the body to whatever chassis the buyer had in mind. His earliest product was designed for a Chevrolet chassis, but by 1958, he had amassed 27 different bodies with the capability to fit chassis varying in width from 40 to 52 inches and from 78 to 106 inches in wheelbase... and any one of them could be had in bare shell form for a paltry \$295.

But it was the other pieces Devin offered that set him apart from his

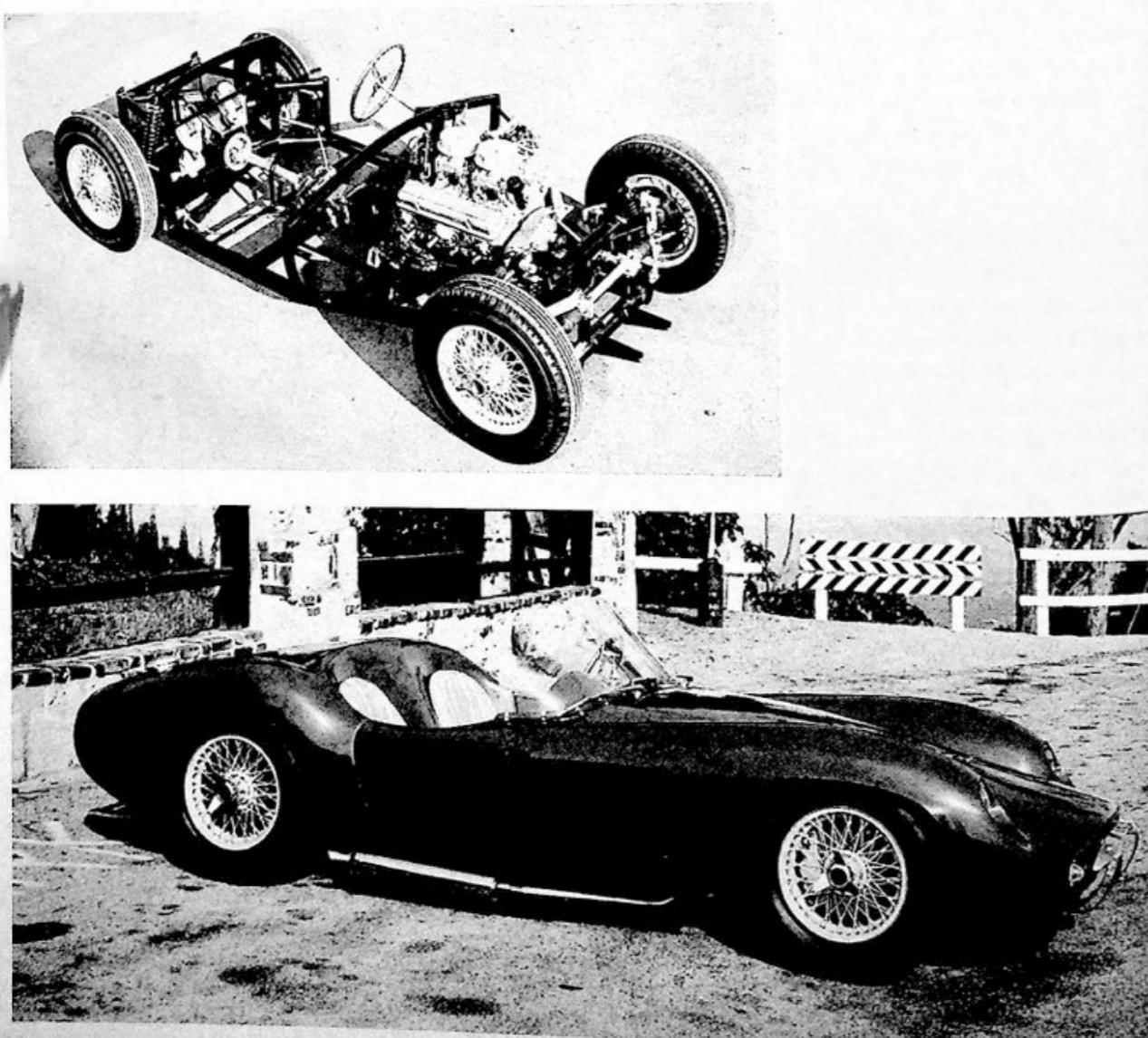
peers, pieces that other manufacturers forced you to either do without, fabricate for yourself or scrounge through junkyards for. Devin offered an inner fiberglass "liner" that bonded to the cockpit to form the seats and transmission tunnel. Also available were inner door panels, headrests, windshields and all sorts of other amenities that made Devin cars the class of the field and helped kit cars make the leap from being the exclusive toys of a small group of hard-core enthusiasts to everyday transportation.

And, as always, a class act works. By the mid-'50s, Devins were the rage among enthusiasts and were being used as the foundation for a variety of popular "specials," including Dean Moon's Moonbeam Bonneville car and V8-powered road racers by Ak Miller and John "Bat" Masterson. Such was the success and fame of the Devin kit cars that word spread overseas, and

one day Bill Devin got a call from Malcom McGregor, a car builder in Belfast, Ireland, seeking some advice on body mounts for a chassis he was building. Devin was so impressed with the chassis that the two got together to form Devonshire Engineering, and hatched a plan that could, and should, have given Bill Devin the legendary status that Carroll Shelby went on to claim.

Devonshire Engineering would build the chassis in Ireland, then ship them to Devin's shop in El Monte where he would turn them into finished vehicles... and he'd have accomplished the trick of turning his kit car operation into a legitimate manufacturer of high-performance sports cars. It almost worked.

The Devin SS was, by the standards of the day, a terrific car. The chassis supplied by Devonshire was beautifully designed and fabricated of three-inch-diameter tubing, fully triangulated, and complete with side-impact protection and stiffening hoops under the cowl and behind the

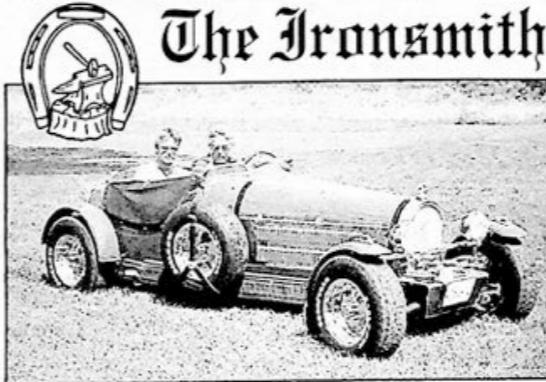


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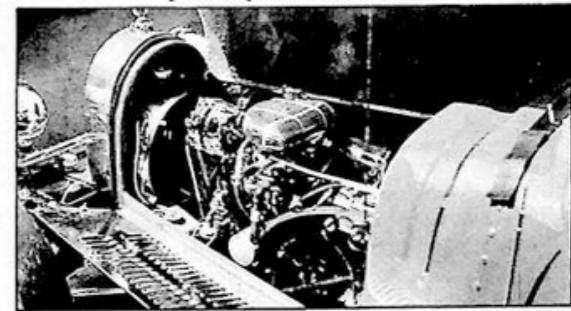
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# PREHISTORIC

seats that acted as rudimentary rollbars. There was even a welded aluminum firewall and foot boxes that separated the engine from the cockpit.

Power was supplied by a 283-cubic-inch, 290hp Corvette V8 mated to a Muncie four-speed manual transmission. The front suspension was comprised of parallel wishbones and coil springs, with massive Girling disc brakes (in an era when most cars, even sports cars, still had drum brakes). In the rear was an unusual DeDion independent suspension setup, with parallel trailing arms and Girling discs mounted inboard.

The result of all of this parts pairing was arguably the most sophisticated chassis available in 1958, and Devin carried the top-quality theme throughout the car, with triple-laced wire wheels, leather bucket seats, full complement of Stewart-Warner gauges, wood-rimmed steering wheel, side curtains and convertible top.

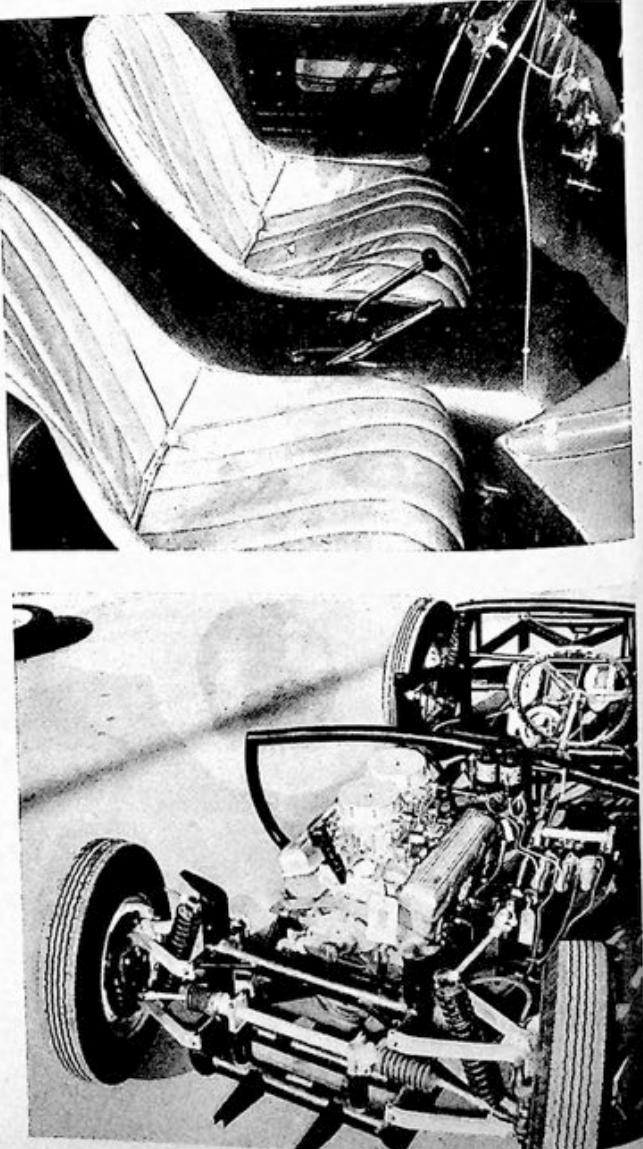
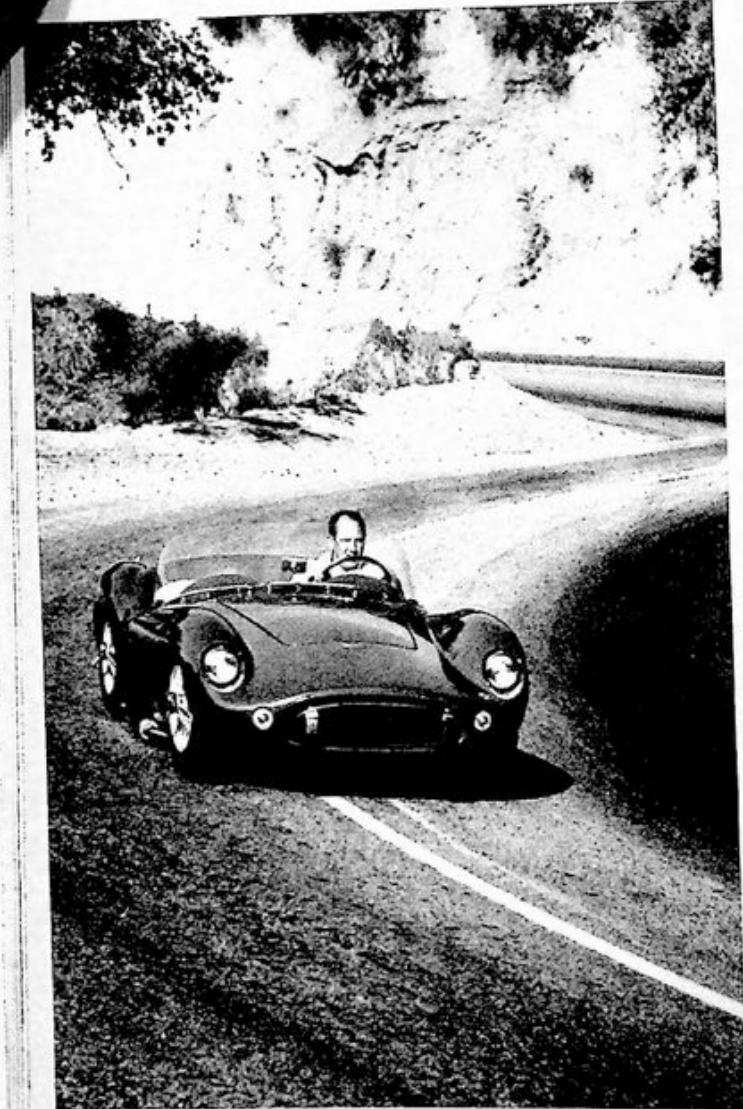
The fiberglass bodywork was superbly finished, and with most of the Devin SSs painted red they were frequently mistaken for a Ferrari, which was not so much of a compliment as an innocent mistake. Corvettes of the day had drum brakes, a live axle rear suspension and a 0 to 60 time of 6.6 seconds. Zero to 100 mph took 18 seconds, and, with a fuel-injected engine, a Corvette cost about \$5000. The Devin SS cost \$5950, had independent suspension, disc brakes, a 0 to 60 time of 4.2 seconds, and would accelerate from 0 to 100 in just 12 seconds. To get that level of performance in any other car would have required a trip to Italy, and double the money, which you would spend on the very Ferrari that Devins were frequently mistaken for.

Which leaves us trying to explain why—despite the car's mechanical sophistication and attention to detail, despite a massive advertising

campaign, despite the glowing reports in enthusiast magazines, and despite the fact that a group of Chevrolet engineers with sports car backgrounds wanted to make Bill Devin the high-performance legend that Carroll Shelby eventually became at Ford—the Devin SS was Bill Devin's Waterloo, the hot property that nobody wanted, the seemingly certain success that somehow never got off the ground.

Too late for the immediate post-war performance car craze, too early for the horsepower madness of the '60s. He was the right man in the right place with the right product, but at the wrong time. No precise figures exist, but it is likely that no more than 15 of the Devin SS models were ever built.

Then came the scrambling. Zora Duntov had no stomach for two roosters in Chevrolet's henhouse, so the GM/Devin connection never happened. Devin then tried to get funding to build a hundred of his cars so they could be passed off as GT racers, but was unable to find backing. He continued to advertise the SS, even into the mid-'60s, but sold only a few. **KC**



30 KIT CAR

**HOT ROD**  
Magazine

# Mustang



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# RED ALERT!



## A FAST-MOVING, TRAFFIC-STOPPING FIERO GTO STYLING

By Dave Fulls

**T**HE GTO HAS returned. After more than a 20-year absence, the legendary Ferrari is back. Equipped with all the style, performance and brute force of the original 250 GTO, the '80s model is ready to take on the challenge.

Ferrari began production of the new GTO model in mid-1984. Well, sort of. Before the car even made its appeal to the general public, the total production allotment (set at 200 cars) plus the 20 "competition vehicles" had already been spoken for. Ferrari enthusiasts and collectors can be found all over the world, and when offered an enticing new version, they'll buy it with no questions asked—especially with such a limited amount available. The GTO's price was originally set at about \$90,000. Since then the price has doubled and is still rising. Truly a sign that the

car will continue to increase in popularity.

The fabled 250 GTO of '62-'64 combined beautiful lines and exhilarating power and performance with an almost unbelievable winning record on the race tracks to make the car a collector's item long before production was even completed. This prestigious destiny was further guaranteed by the car's limited production. Over the three-year span that the 250 GTO was manufactured, only 39 cars were built. Today, the 250 GTO is perhaps the most collectible Ferrari of all, with current prices well above \$300,000.

Based on the Ferrari 308 GTB, the new GTO was designed to challenge the best of them, as was its predecessor, the 250 GTO. A twin turbocharged, all-aluminum V8 is at the heart of this born-again



*Alden-Thomas GTO is definitely photogenic. Its beautiful Ferrari lines look even better as the car's speed increases. Additional height in the cockpit area is the only discernible variance between the GTO made in Maranello, Italy, and this version from Eugene, Oregon.*

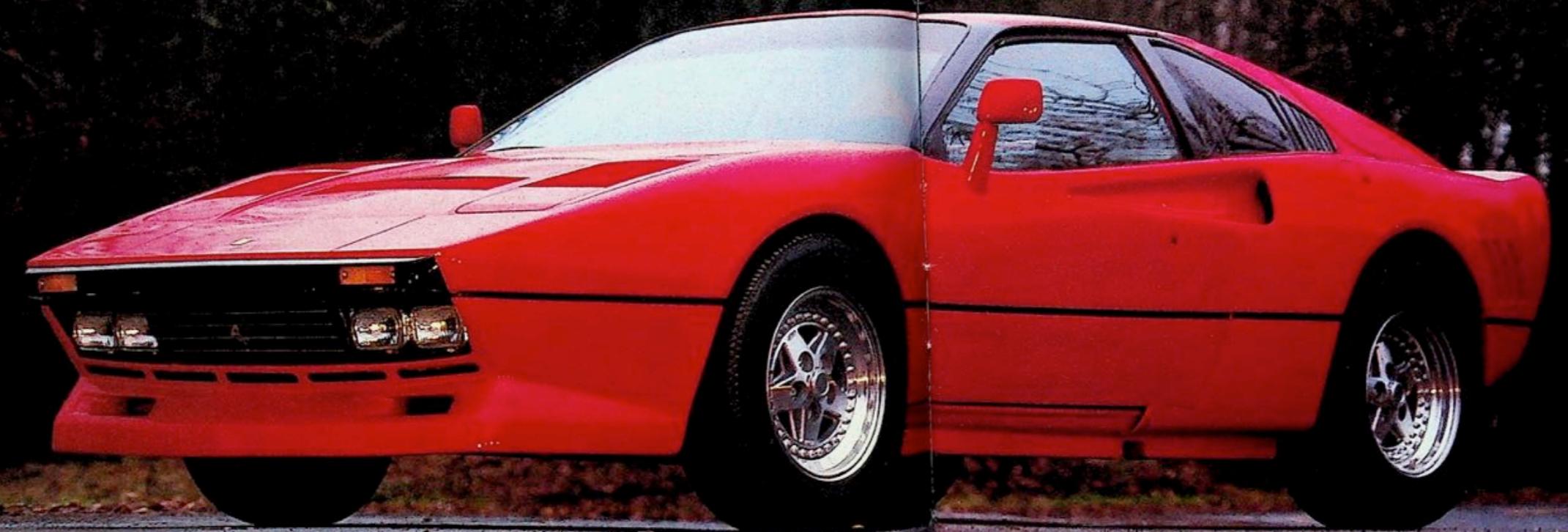


*GTO's super-low front end and grillework are hard to ignore. Provided in the kit, Quad driving lights look great and should improve visibility on those late-night excursions.*



*New body clip drastically reshapes the Fiero's rear end. Original Ferrari taillights are nice but aren't cheap. Fiero owners will be hard-pressed to spot their favorite transportation under new fiberglass. Notice the extensive ventwork on engine cover and the shark gills on lower rear quarters.*

# RED ALERT!



## A FAST-MOVING, TRAFFIC-STOPPING FIERO GTO STYLING KIT

By Dave Fults

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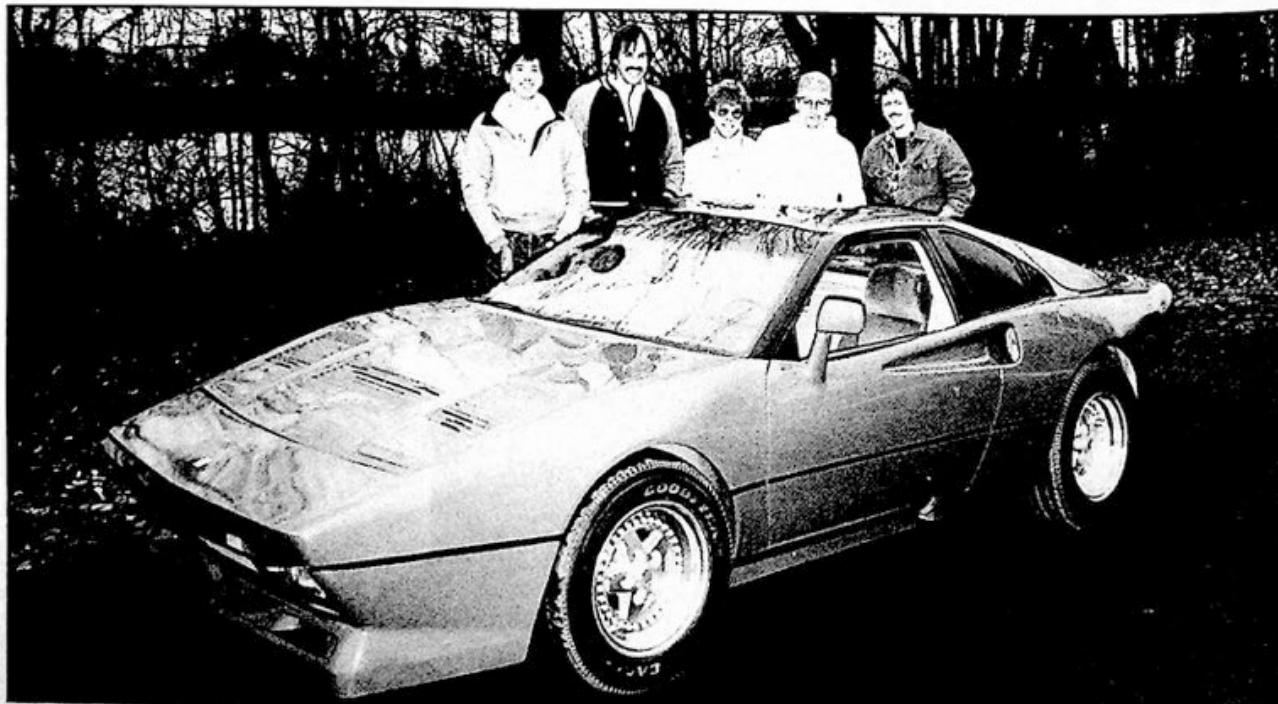
New body clip drastically reshapes the Fiero's rear end. Original Ferrari taillights are nice but aren't cheap. Fiero owners will be hard-pressed to spot their favorite transportation under new fiberglass. Notice the extensive ventwork on engine cover and the shark gills on lower rear quarters.

# RED ALERT!

legend. Equipped with four overhead cams and 32 valves, the motor produces more than 400 horsepower. The GTO's drivetrain is positioned longitudinally, which allows the powerplant to sit closer to the pavement. This setup is opposite that of its cousin the 308 GTB, which has transverse mounting. The GTO's chassis and suspension also uphold Ferrari's tradition.

No one was surprised by the GTO's awesome styling. Though the obvious resemblance to the 308 can be seen, the new GTO has been updated in both styling and performance. We're not trying to detract from the 308 GTB, but we're talking a whole different ball game here. The GTO's body panels were given an unprecedented Italian touch. Curves were added in all the right places. Styling lines were changed to give the car that extra pizzazz, which helps give Ferraris their distinctive flair. Additionally, these panels feature state-of-the-art materials, such as Kevlar, carbon fiber and Nomex. All of these enhancements, including lots of horses and fabulous handling, packaged in a beautiful wrapper weighs only 2555 pounds. The result—an incomparable work of art.

So where does this handsome price tag leave us average people who want to own this magnificent machine? Well, my fellow Ferrari fans, all is not lost. Enter three enterprising young men from Eugene, Oregon: Mike Kenney, Tom Landgreen and Rick May. They are the brain trust behind the Alden-Thomas GTO styling kit. Alden-Thomas Motorcars (2795 Garfield, Eugene, OR 97405) was created at about the same time we saw our first pictures of the new Ferrari GTO. It captivated the hearts of these three men, as well as the rest of the world. And since they couldn't afford an original, they decided to build their own.



The crew that made it all happen. From left to right; designers Tom Landgreen, Rick May, Mike Kenney and bodymen

The Pontiac Fiero was chosen as the base for their version of the GTO for a number of very important reasons. It provides a good foundation for the kit as its overall shape is similar to the GTO, therefore, accepting the transformation easily. Radical component construction also makes the job simpler since the Fiero's body panels are non-stressed parts and are easy to remove and install. The Fiero's performance and road manners, while not even close to that of its Italian counterpart, will satisfy most drivers. Lastly, the Fiero's growing popularity. The Fiero Owners Club of America has more than 6000 members, which is a good supply of potential customers.

The project began when Mike purchased a plastic, scaled-down model of a Pontiac Fiero. He then proceeded to modify it to resemble the GTO. With the scaled-down model and initial research completed, it appeared as though Mike and his partners' original idea that the Fiero would make an excellent base for the GTO styling kit was correct. Research continued, drawings were made and the team decided to keep going with the project.

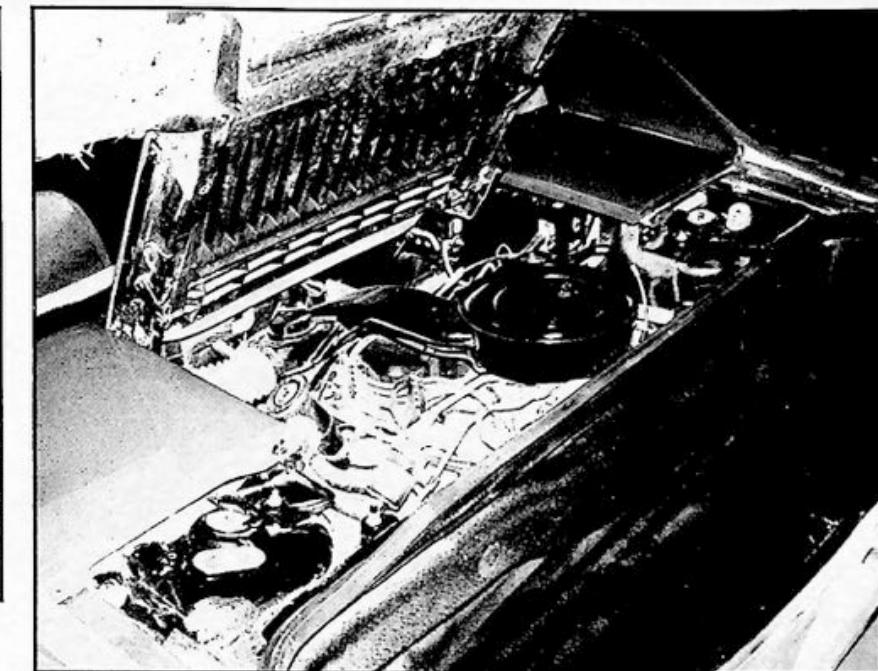
The next step was the development of a full-scale mock-up, so the team purchased a 1985 Pontiac Fiero. The transformation from Fiero to GTO began with bonding sheet foam to the Fiero's body panel and molding it to the GTO's shape. After the foam was shaped correctly, fiberglass cloth was installed, which began to give the Fiero a GTO look.

It was during this part of the project that we at *KIT CAR* Magazine first learned of it. We received a letter from Mike in which he explained the project's concept. Included was a number of questions he thought we'd be able to help him with, and snapshots of the early mock-up. We contacted him immediately to find out when we could see it.

We got our first glimpse of the car at the Northern California Kit Car Show a couple of months later (see article in March '86 *KIT CAR*, page 60). Although we



Side air intakes are copies of originals and route fresh air to engine compartment. Note absence of door handles and the redesigned sailplanes. Gas filler door on driver's side is functional while passenger-side oil filler is only cosmetic.



Alden/Thomas conversion leaves engine compartment and rear storage area virtually unchanged. Later-model Fieros have grillwork instead of panels in two forward corners of rear deck. Pieces could be fitted to any Fiero and would highlight kit vent in new engine compartment cover nicely.

saw only a rough mock-up in unfinished fiberglass, the shape of the car was very close to the GTO's, which tells us that a lot of hard work went into its development. Mike, Rick and Tom explained that some improvements were going to be made, and they hoped to have the kit available by the summer of 1986. By now we were very enthusiastic and informed them that we would be interested in following the kit's development.

Since then, the guys at Alden-Thomas have been extremely busy. Numerous areas of the car were changed, inspected for accuracy and then modified to resemble the GTO. When they felt that the mock-up was near completion, Dave Gailhouse and Ed Hubbs were hired to finish the bodywork and prepare the prototype components so that a set of molds could be constructed.

The Ferrari shape and body lines have been captured and successfully transferred to the Fiero. Small changes and revisions were made to compensate for the Fiero base, but the flow of the Italian design is intact. The front spoiler has been slightly extended but can be modified. The only other major difference is the kit's overall height. It is much taller than the original from the top of the doors and up, but the effect is outstanding.

For our photo session of the car, we chose a location next to the Pre's Trail near the University of Oregon campus. During the shoot, one group of long-distance runners asked us if the car was a Ferrari GTO. An hour later, the same group returned and stopped to investigate. We explained that the car was a Fiero with a GTO styling kit. Even with the knowledge that this wasn't an original, the runners couldn't resist looking back for another glimpse of the car as they continued on their journey. That's the effect the car had everywhere we took it.

Basically, the kit consists of 10 major body panels, eight vent panels, a grille and an array of driving lights and assembly hardware. Installation is

straightforward and easy. All kit body panels attach to the O.E.M. factory mounting points, and all Pontiac body panels are removed from the vehicle, with the exception of the forward portion of the roof. The Fiero panels can be sold or retained for reinstallation later, although we can't understand why anyone would want to.

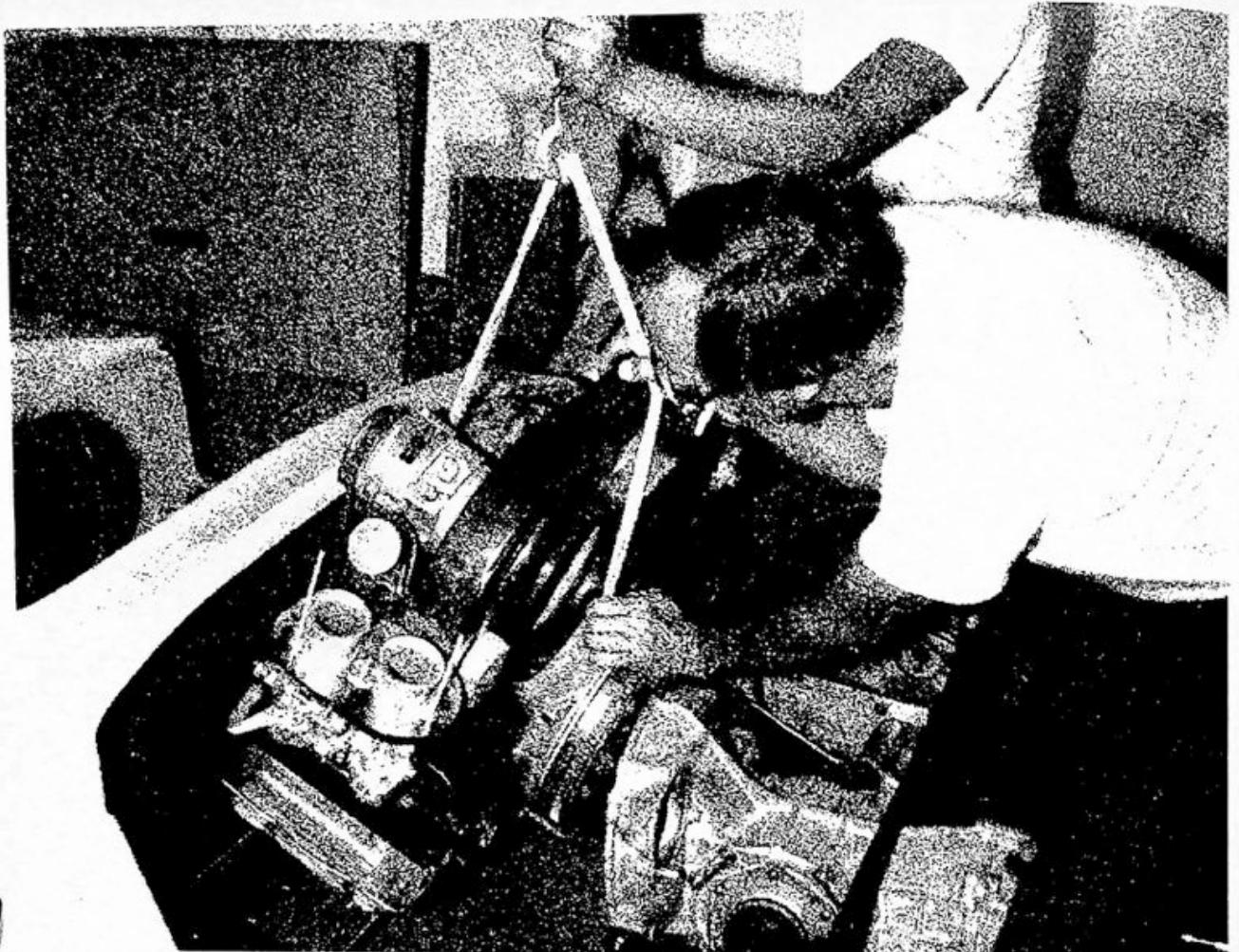
A few minor modifications must be made during installation. First, alter the inner structure of the doors to accommodate the GTO's side air intakes, then rework the door-locking mechanism and trim the front wheelwells. None of these steps are difficult, and they won't compromise the strength of the O.E.M. parts.

Base price for the Alden-Thomas GTO styling kit is expected to be \$6995. The kit will be available for all Fieros—the four-cylinder, six-cylinder and the GT. For those of you with the sunroof option, the Fiero O.E.M. sunroof fits in the forward section, which remains unmodified.

Alden-Thomas is also planning to offer an interior kit that will give the car extra Italian flair. Again, this option will feature easy installation and require no major changes. A video assembly manual is in the works and plans are underway for a Fiero performance parts supplier to provide both H.P. engine packages and suspension kits as other options.

Drive-in and drive-out service as well as turn-key cars will be offered by Alden-Thomas and, depending upon equipment and services required, should run about \$15,500 for a conversion on a customer-supplied car and \$29,500 for a fully loaded turn-key model. Early response has been so overwhelming that a dealer network is being organized to better serve its customers.

Bolt-on styling kits have been gaining momentum lately and are becoming a major force in the kit/specialty car market. If the Alden-Thomas GTO is any indication of what we can expect in the future, we have a lot to look forward to.



**F**EW THINGS BECAME legendary in their own time. The Volkswagen engine has, however. Wolfsburg engineers have created an eloquently simple four-cylinder engine whose impact on the kit car scene is unmatched. Oh sure, there are more exotic, more powerful engines, but few possess the overwhelming appeal of the air-cooled VW.

All Volkswagen air-cooled engines are based on the same case and heads. The differences lie in the way each is outfitted for a particular car line. The Type 1 engine, for instance, found in Sedans and Ghias, is preferable for kit car builders because of its compact "upright" stature. Volkswagen buses employ Type 2 engines; essentially carbon copies of the Type 1 save for minor sheetmetal variations. Type 3 engines, used in Squarebacks, are similar to Type 1s but less desirable because of their flat, horizontal configurations, which require a wide engine compartment.

Obviously, the best VW powerplant is a Type 1 or Type 2, since most VW-based kit cars require a compact, upright engine. So the question is: unless your specialty car is blessed with an extra-large engine compartment, should you forget the Type 3 altogether? Well, not quite. With a little creative parts swapping

and wrenching, the V-Dub pancake four-banger can be transformed into a roadworthy upright suitable for kit car transplantation.

Volkswagen offered the Type 3 in two displacements—1500 cc and 1600 cc—from '61 to '73 in Squarebacks, Fastbacks and a few Notchbacks that made it to the States. Dual carbs and higher compression were offered in '64. In '66, this "high-performance" option was available only on the 1600, while the single-carb 1500 remained the baseline engine. In '68, fuel injection replaced carburetors across the board. If your engine building plans call for an all-out street killer, by all means find a '67 or later model that has dual-port heads. These breathe better than single-port heads and produce more torque throughout the powerband.

Converting a Type 3 engine to an upright does require a bit of mechanical laboring. Nothing too demanding, but knowing the ins and outs of VW engines will make the task easier, as will having a factory manual close by. Basically, the procedure entails removing all exterior engine components—sheetmetal, intake and exhaust systems—and replacing them with comparable Type 1 components.

There is an amazing amount of interchangeability between the various

VW engines. In most instances original Type 1 parts can be substituted, but like many street-wise enthusiasts, engine-builder Lew Holloman chose to add a few high-performance parts and eye-dazzling polished pieces during the transformation of the '67, 1600cc Type 3 shown on these pages.

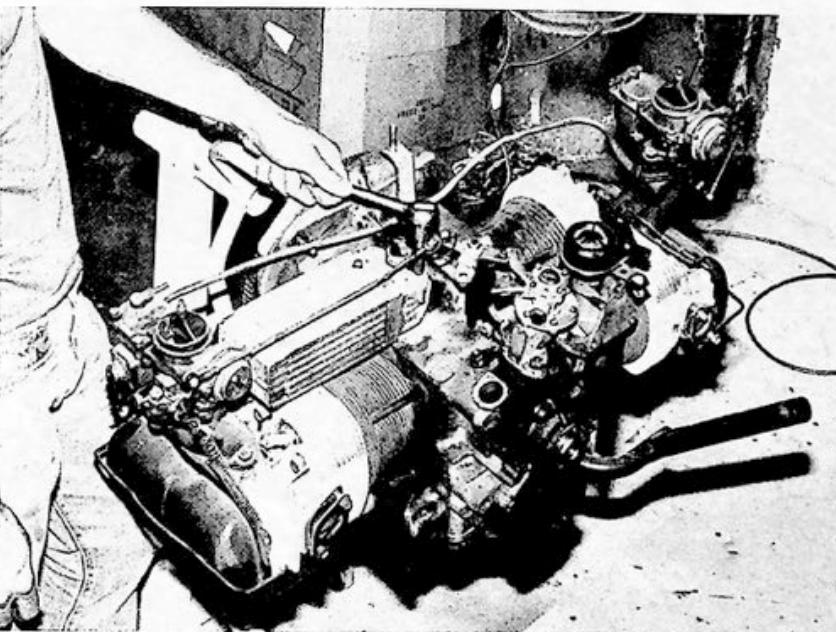
After the engine is stripped of all external components, the next step is to swap the stock crankshaft pulley for a Type 1 pulley, which locates the fan belt closer to the case and inline with the generator, once it's reinstalled. In this particular application, Holloway opted for a six-inch-diameter Power Pulley and Sand Seal kit from CB Performance (28813 Farmersville Blvd., Dept. KC, Farmersville, CA 93223). The Power Pulley is smaller in diameter than a stocker and turns the fan and generator at a slower rate of speed, thereby reducing parasitic horsepower losses. Additionally, the shorter Type 1 pulley bolt must be used, as the Type 3 will be too long.

VW engines don't have an oil seal at the crank snout. Instead, slinger threads on the stock pulley are used to keep oil inside the case. In order to guarantee that dirt stays out and oil stays in, a Sand Seal was installed. This is a popular and practical modification usually done to engines destined for sand drags and dune

# ENGINE-ILITY!

## ADAPTING VW'S "PANCAKE" MOTOR FOR KIT CAR USE

By Steve Stater



The first step is to strip the motor of all non-essential external components. This includes sheetmetal, intake and exhaust systems.



The stock Type 3 pulley must be replaced with a Type 1 pulley. As an extra measure of protection, an aftermarket neoprene crankshaft seal is installed in the case.

activity, and well worth the effort even for a street motor. The Power Pulley and Sand Seal come together as a kit, and the two must be used in conjunction with one another. The neoprene seal installs without any disassembly or machining of the case.

Since the stock oil cooler is discarded, an oil cooler bypass valve becomes a vital part of the conversion, as does a remote cooler. The Type 3 case must also be modified to accept an oil pressure sending unit. A boss on the upper left side of the case, near the distributor, is an ideal mounting location and needs only to be drilled and tapped for a 1/4-inch NPT fitting. This puts the sending unit adjacent to a main oil passage, thereby ensuring an accurate measure of the oil pump's output. Also retired from use is the stock oil filler neck and draft tube. These are replaced with an O.E.M. Type 1 oil filler/generator tower, which is a direct bolt-on.

The original dipstick and tube should be replaced with a Type 3 dipstick adapter, available through CB Performance. This adapter allows the use of the shorter Type 1 stick and is a bolt-on replacement for the stock Type 3 tube.

When it comes to engine sheetmetal, the factory '71 and later Type 1 "Doghouse" fan housing is preferable

because it is exceptionally efficient at circulating air around the engine. Other fan housings from earlier years will work, though. It's best to stay away from 40-horse housings, however, as these are small, narrow and woefully inadequate for all but the most sedate engines.

If it's sparkle you're after, the aftermarket is full of high-efficiency fan housings. Various styles are available and many come in chrome or polished aluminum, usually with matching cylinder covers to give your engine a custom, integrated look.

If for no other reason than aesthetics, the stock VW valve covers and their retaining clips on our project engine were replaced with a pair of lightweight cast aluminum covers. These are held in place by a stud/self-locking nut arrangement to ensure a tight gasket seal and to prevent oil leaks.

As for an induction system, most any

Type 1 setup will work, be it a stock one-barrel Zenith carb, a single two-barrel, or a dual-quad, and it will bolt on without any alterations. But what self-respecting kit car builder would be content with a single-throat setup. Holloman fitted our engine with a pair of Dellorto DRLA carbs with 36-millimeter venturis, intake manifold and linkage acquired from CB

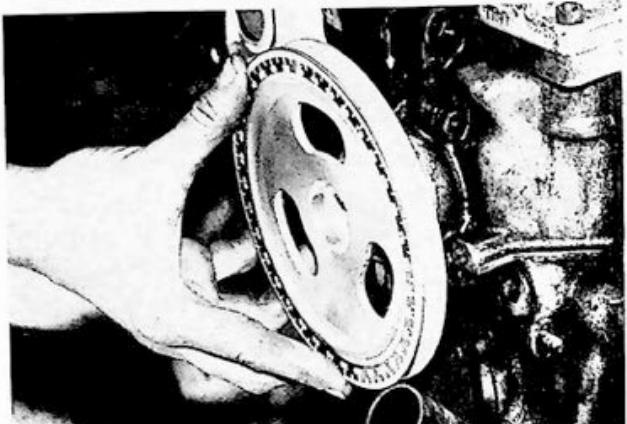
Performance. The dual carburetor kit includes everything you need to install the downdrafts along with comprehensive instructions and tuning tips.

After the old gasket material remaining on the heads is cleaned away, the new intake manifolds are bolted in place, the carbs are positioned atop the manifolds, and the whole package is secured with the hardware provided. The linkage is then connected, air cleaners installed and fuel lines routed.

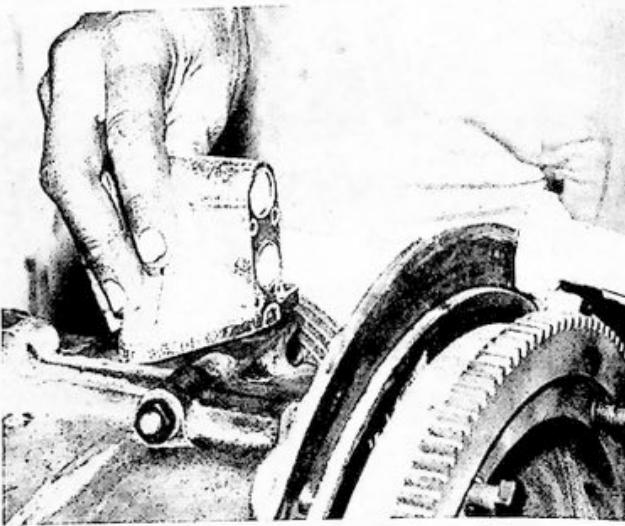
To further enhance the engine's pavement-wrinking capabilities, a Bosch .009 distributor and 9-millimeter plug wires were installed to ensure that a healthy spark reaches the cylinders throughout the rpm range. Swapping the original distributor for a Bosch unit isn't required when converting a Type 3 to an upright. In this case, it was done only to augment the engine's new free-breathing induction system.

It should be clear to you by now that with a bit of judicious tinkering and intelligent selections from the aftermarket parts bins, that clapped-out pancake motor wasting away behind your Mother-In-Law's garage may just be the ticket to getting your VW-based kit car one step closer to the tarmac. All it takes is a little "engine-uity!"

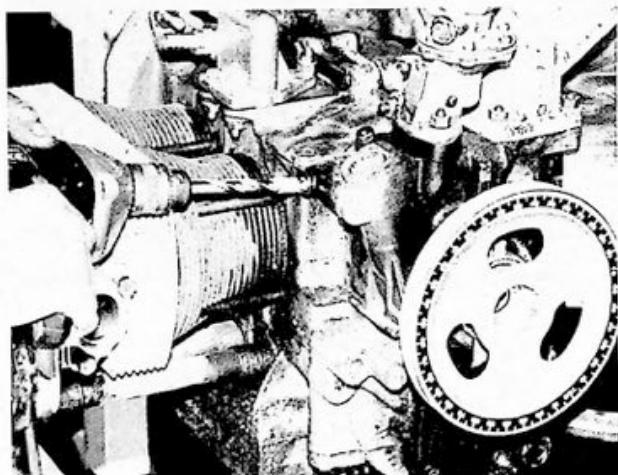
# ENGINE-UTY!



Once the new seal is lightly tapped in place, the Type 1 pulley can be affixed. We used a Power Pulley and Sand Seal kit from CB Performance.



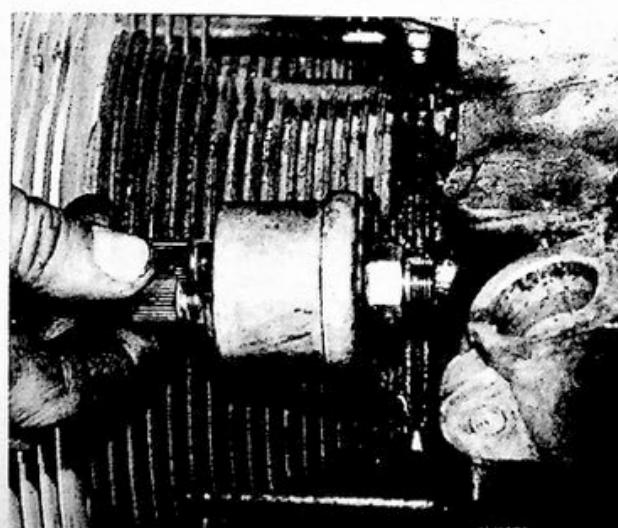
Since the stock oil cooler is discarded, an oil bypass valve becomes a necessity. It bolts in place of the Type 3 cooler and allows the usage of a remote oil cooler.



When the Type 3 oil cooler is discarded, so should the oil pressure sending unit. The Volkswagen engine case can, however, be easily modified to accept a sending unit.



Once a boss near the distributor is drilled out, it is carefully tapped for a  $\frac{1}{4}$ -inch NPT fitting. Work slowly during this phase and use plenty of thread lubricant.



The oil pressure sending unit is then secured in place. Be sure to use Teflon tape on the threads of the sender to ensure a tight seal.



The stock Type 3 oil filler and draft tube are also discarded. In their place goes a Type 1 oil filler/generator tower, which easily bolts in place.



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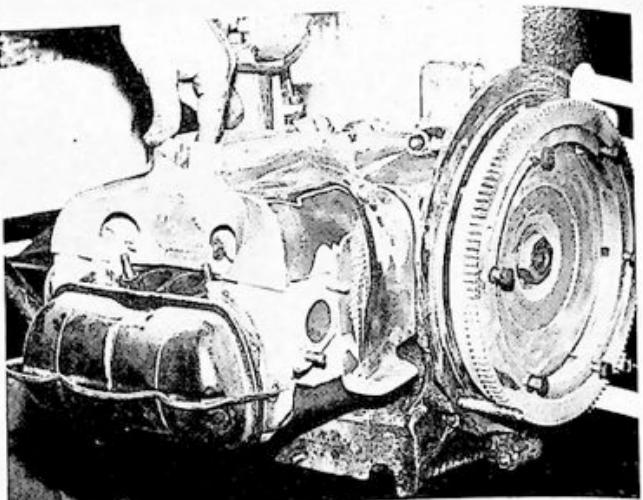
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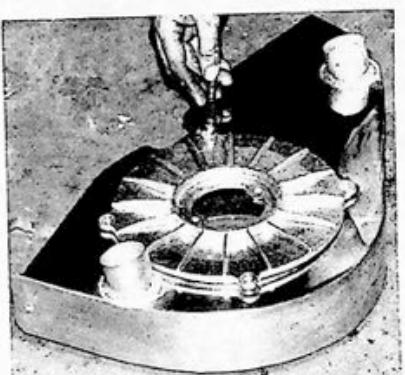
# ENGINE-URITY!



A CB Performance cast aluminum oil filler breather box is mounted to the oil filler tower. It is internally baffled to separate engine oil/blowby and return oil to the crankcase.



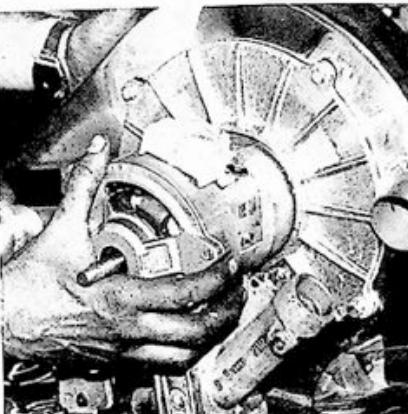
Reassembly of the updated engine begins with the installation of the Type 1 sheetmetal. Here, CB Performance polished aluminum cylinder covers are being installed.



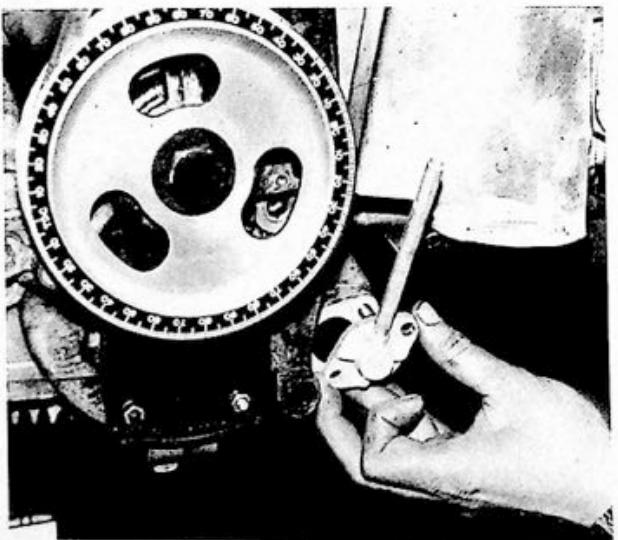
Instead of using an O.E.M. Type 1 fan housing, we selected a polished aluminum Ram-Flow housing from CB Performance, which goes nicely with the cylinder covers. It's available with or without fresh air outlets for a heater.



For optimum engine life, we installed a two-row, remote oil cooler from Perma Cool (671 E. Edna Place, Dept. KC, Covina, CA 91723) before the fan housing was bolted in place. A remote oil filter can also be easily incorporated, if you desire.



With the fan housing in place, we then mounted the generator to the tower and connected it. Behind the generator is a replacement fan mount with aluminum fins to dress up the engine.



The stock Type 3 dipstick and tube can no longer be used. A Type 3 dipstick adapter allows the short Type 1 stick to be used and provides an accurate measure of the sump's holdings.



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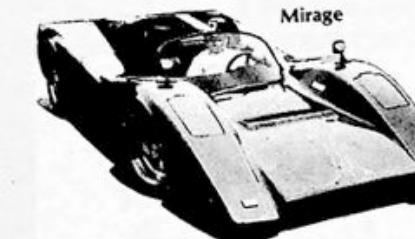
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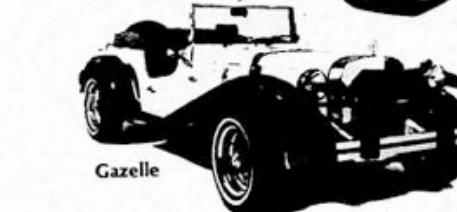
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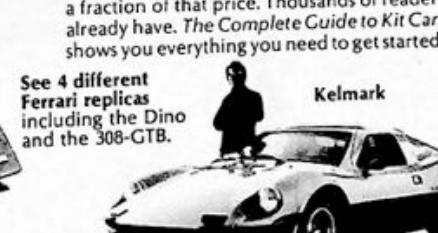
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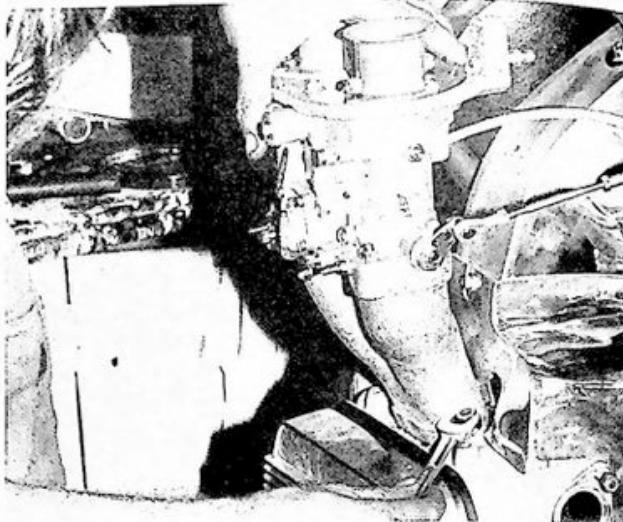
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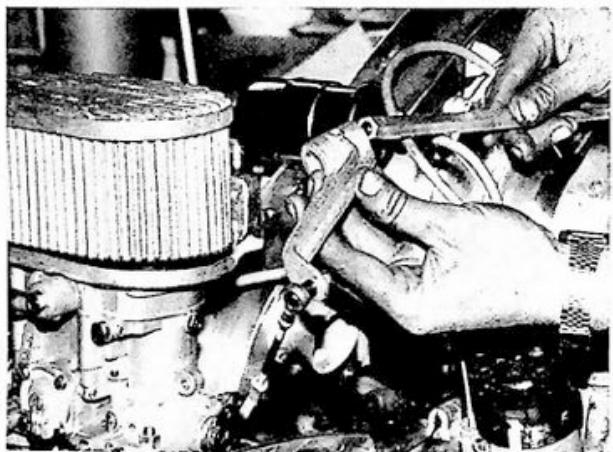
# ENGINE-UTY!



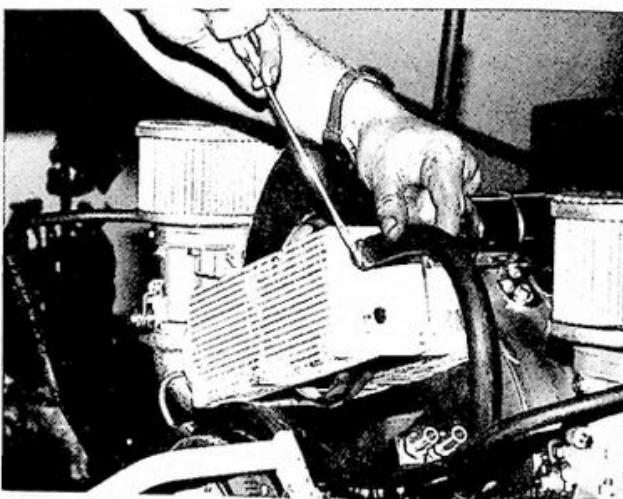
To spruce up the engine a bit, Lew added a pair of CB Performance finned valve covers. These are held in place with self-locking nuts for a leak-free fit.



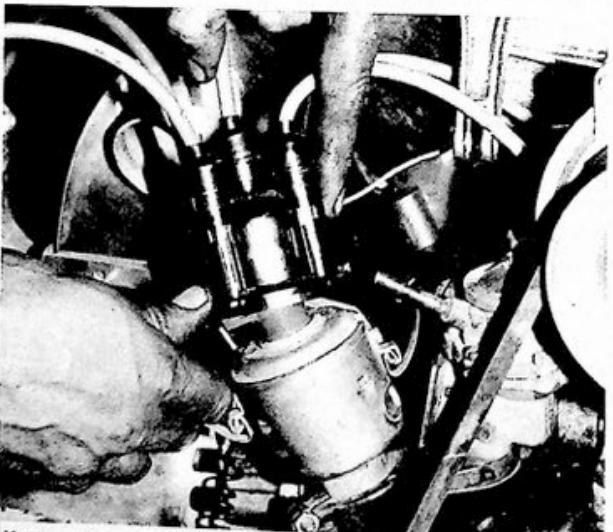
When it came time to select an induction setup, Lew again headed to CB Performance and purchased a Dellorto intake system.



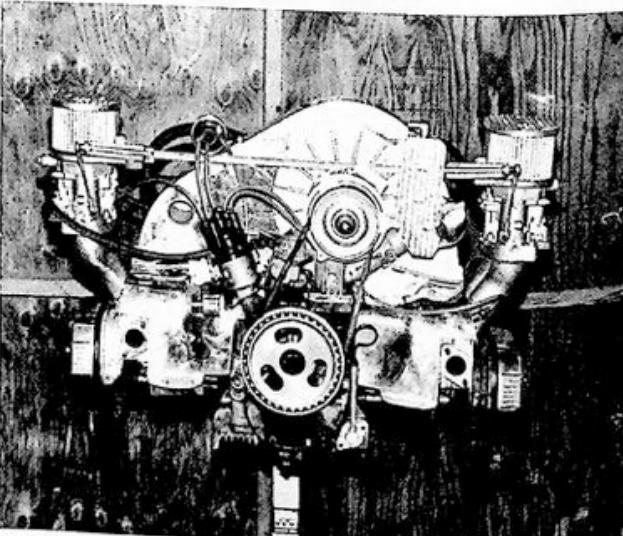
Next, the aluminum intake manifolds were installed, followed by the carbs, linkage and air cleaners. A stock VW throttle cable works perfectly with the Porsche-style linkage.



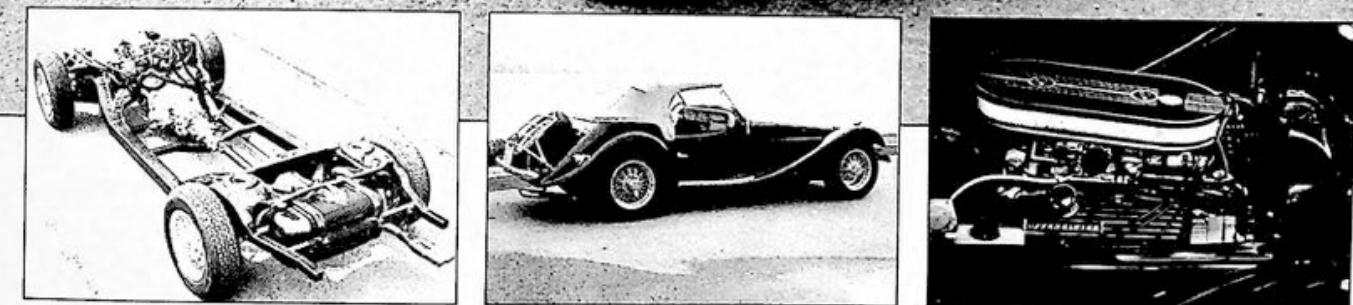
At this stage the engine is nearing completion and beginning to look more like a Type 1. The oil cooler lines are routed and connected as well as the fuel lines.



If you plan on adding horsepower with bolt-on pieces, then a performance ignition system should be installed. Lew uses a Bosch .009 distributor, coil and 9mm wires.



Finished! You'd never guess our street-savvy VW mill started out as a '67 1600cc Type 3, now would you? This is an excellent powerplant for any VW-based kit car! KC



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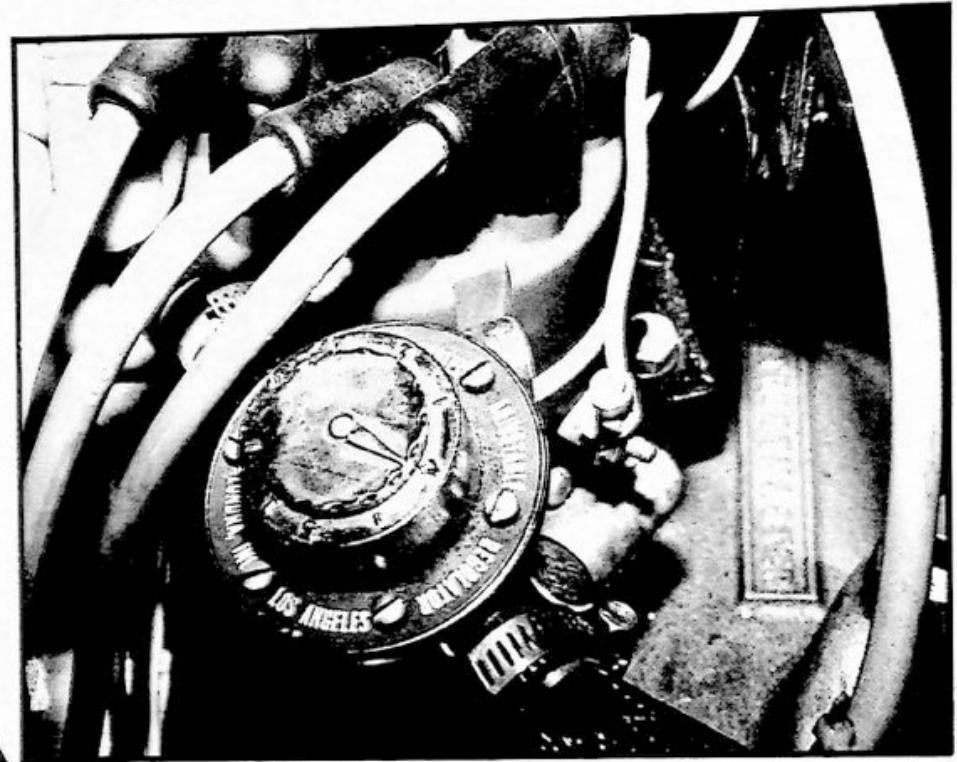
*Road & Track Magazine — October '82 issue*

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# stemming the flow



## A FUEL REGULATOR IS ALL YOU NEED

By T.A. Sunderland

The adjustable fuel regulator works on an internal diaphragm design that reduces fuel pressure in the line. The regulator kit includes all the fixtures and is set to work on a  $\frac{1}{2}$ -inch fuel line.

**N**INE TIMES OUT of 10 the adage "If some is good, then more is better" is a lie. Nowhere is this more true than when applied to fuel line pressure. One of the easiest areas to apply "overkill" is when feeding fuel to those big, mean and nasty carbs you bolted onto your pride-and-joy. Oh sure, we understand you just wanted to see that they had enough to drink, but not unlike yourself, they're going to choke if you shove too much down their throats.

The most common misunderstandings are in the area of fuel line pressure. In the strongest of high-performance road racing engines, seven psi of fuel line pressure is used. For nearly any high-performance street engine, four to five psi is plenty. The trick to making sure the carbs have enough fuel isn't in fuel pressure, but in fuel volume. For example, a 2180cc VW engine using dual 40mm Weber carburetors needs a fuel pump volume rating of 20 gallons per hour to supply it with enough fuel under hard use. An in-line fuel pressure of just three to four psi is perfect. A strong, dual-carbed big-block V8 needs a pump volume rating of about 55 gallons per hour and six to seven psi of fuel line pressure, maximum.

The problem with too much fuel pressure is that the incoming fuel can overpower the floats, whose job is to control the volume of fuel the carb holds. The fuel then passes by these shut-off controls and directly into the throat of the carb, making the fuel/air

mixture too rich. Immediately the car begins to run so poorly that it's undriveable or floods out altogether. It's not unheard of to hydraulic an engine when trying to restart it. If the pressure is great enough, the fuel can push its way out of the float bowl gaskets and onto the hot engine and set the whole project ablaze.

The cure is simple. First, when buying a fuel pump, check its gallons per hour rating. A good baseline is a pump that puts out between 20 and 60 gallons per hour. Not every fuel pump manufacturer puts this data on the side of his product's package. But, a good parts man can find this information in his books. Next, note the pump's fuel pressure (psi); again, somewhere between three and six pounds is fine. Next, purchase a fuel pressure regulator. Most models are pressure adjustable. An example would be the one from C.R. Industries in Elgin, Illinois, which retails for about \$20. For a fixed-line pressure regulator, Miles Master, Inc. of Exeland, Wisconsin, makes a  $3\frac{1}{2}$ -pound unit.

For those of you who like to take everything one step further, an in-line fuel pressure gauge is the hot tip. This would allow you to monitor the system's pressure at all times, including different driving conditions. It's a dandy item for "dialing-in" your car's fuel system, but is most useful for high-performance cars.

When it comes to fuel pressure, a better adage would be; "If too little is bad, then too much would be worse."

KC

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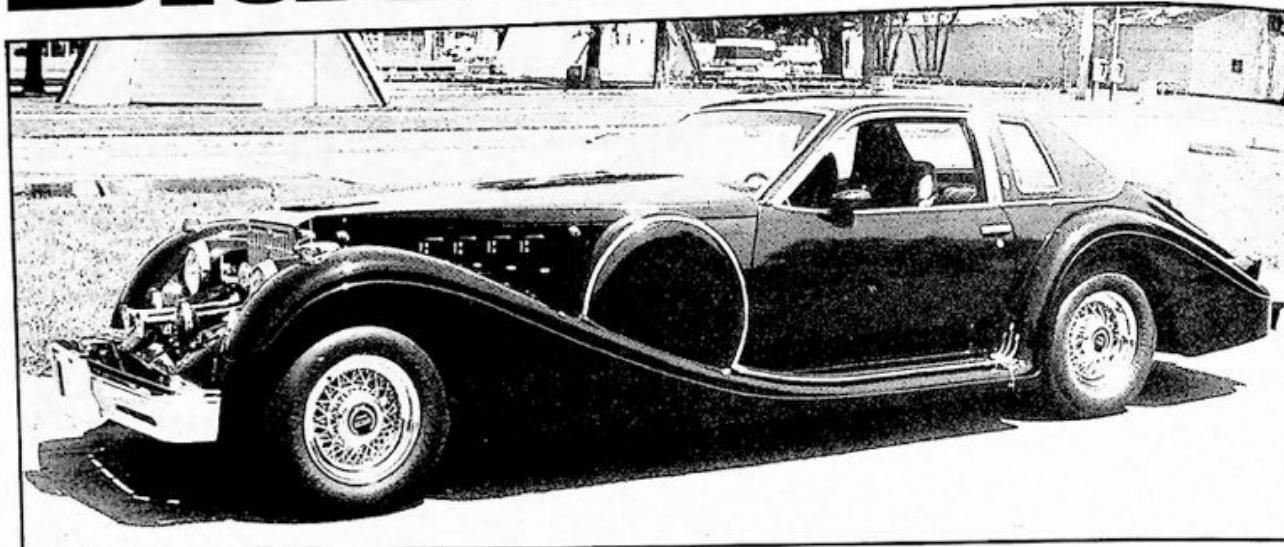


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# Blackstone



## Town Coupe

### A MIDWESTERN GEM FROM LITTLE ROCK

By Peter W. Frey

**L**OOKING AT PICTURES of the Blackstone Town Coupe, the tendency is to immediately assign its origin to one coast or the other—California or Florida—the twin Meccas for the art of car building. But you'd be wrong.

T.J. Housley is a rehabilitation counselor with two decades of service in the city of Little Rock, Arkansas. He has been building three-wheeled trikes as a hobby for the past 18 years, then spent two years and \$70,000 to create what you see in these photos. Oh yes, he also owns 250 Volkswagens (T.J. runs a wrecking yard on the side, you see).

J.T. (Tim) Matchett is a captain with two decades of service in the Fire Department, also of Little Rock. A long-time builder of one-off automotive gems, he's been known to graft the front clip from a Firebird onto an AMC Gremlin station wagon and make it work! Aesthetically, anyway.

Together they are the driving force behind the Blackstone Town Coupe. Matchett designs and builds. Housley provides the money, the legwork, machinist skills and the public relations.

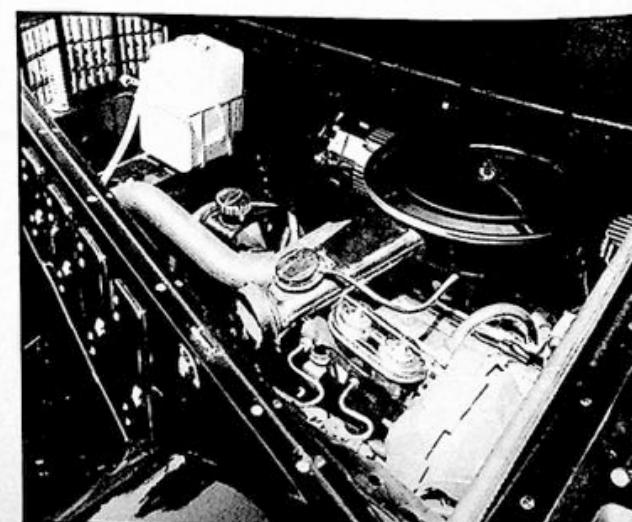
"You can't imagine the adventures we've had in this car. Little Rock is not exactly a hotbed of automotive self-expression, as you might suppose," Housley explains. "I remember there was a Zimmer around for awhile, but since it left, we're pretty much the only show in town."

But not for long. According to Housley, three other Blackstones are being built in Little Rock, and people are beginning to come from out of town to see them.

And why not? Kit car purists will not like the Blackstone at all, but the fact of the matter is that it's a nicely done example of a soon-to-be trend in kit

cars—new body panels for production vehicles. In this issue, you'll find a Fiero that's been turned into a Ferrari look-alike, whereas the Blackstone represents a more subtle, less-expensive option for kit car enthusiasts.

The base vehicle is a Chevrolet Monza or Pontiac Sunbird of '75-'80 vintage. Unlikely vehicles perhaps, but chosen for several logical reasons. "You can buy relatively clean ones all day for \$500," says Housley. "And with it comes power steering, power brakes, air conditioning, power windows, and all the other amenities most kit cars lack." Perhaps most



The hood is hinged in the center to allow easy access to the engine.

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**The Saxon**

# Coupe

important of all, the car will be mobile again after just a few days of work instead of sitting on jackstands in the driveway for months while you fabricate the necessary widgets.

"A couple of days of hard work and you'll have the front fenders off and the new frame bolted underneath," adds Housley. "And from that point, the car is back on the ground and easy to move around as you do the relatively minor sheetmetal and bodywork involved."

That 'minor' work includes tapering the inner fenderwells and rear fenders with either a cutting torch or saber saw so that the new front and rear fiberglass pieces will fit. The only other major work is lengthening the steering column and the power steering, power brake and air conditioning hoses.

Even installation of the new subframe, a custom construction by Al Adams made of 2x6-inch,  $\frac{3}{16}$ -inch wall mild steel tubing, calls for nothing more complex than nuts, bolts and wrenches—and no welding. The subframe extends the wheelbase 40 to 137 inches, but it starts at the front bumper mounts and extends to just beyond the rear wheels, which greatly improves both torsional rigidity and safety.

"I'd hate to pin down how long it would take somebody to build a Blackstone," insists Housley. "It all depends on how hard they work at it. And the project does require the assembler to know his way around a toolbox, but he certainly doesn't have to be a master fabricator. This is *not* a builder's nightmare. We're constantly developing new ways to make the job easier, and we've got new rear bodywork under development that can be installed without any modifications to the existing sheetmetal."

On Housley's prototype, everything, including the

262-cubic-inch engine and Turbo 350 automatic trans, is stock '75 Monza hardware, with a few exceptions. The rear springs are from a '79 Ford Fairmont, the front springs from a '76 Vega, and the rear drum brakes are the larger-diameter versions that appeared on the '77 Monzas. The Blackstone rides on 15x8-inch American Racing wheels, with 225/70x15 radials in front and 265/60x15s in back.

The stock interior has been reupholstered by Larry Smith in a combination of black vinyl and velour. The two major changes are an Oldsmobile Starfire steering wheel and a stereo cassette player with a pair of 6x9-inch speakers in the rear. Hardly the luxury you'd expect from a vehicle that looks like this, but as Housley says, "In my neighborhood, it's considered a status symbol to have a front bumper on your car."

Outside, the familiar Monza body shape has been changed with the addition of front and rear fiberglass fenders, running boards, a new hood and trunk. The external hardware includes a Mercury Cougar grille, VW headlight rims and turn signals, and Austin-Healey Sprite taillights.

"It sounds like quite a conglomeration of bits and pieces, but we took considerable pains to do everything right," recounts Housley. "For instance, the hood is hinged in the middle and opens on both sides for easy access to the engine. The fiberglass is half an inch thick where it needs to be, and the paint is so tough that even though I drive the car every day and park it outdoors in the rain and snow, the finish still looks good."

If you've decided that the Blackstone is your kind of kit car, T.J. Housley will be happy to hear from you. Write him at 8224 Sunny Dr., Little Rock, AR 72103, or call (501) 888-5189. Blackstone kits come in two versions: the \$7500 builder's kit with preassembled glasswork and frame, and the \$9995 deluxe kit that contains all the parts you'd otherwise have to spend weeks hunting down.

KC



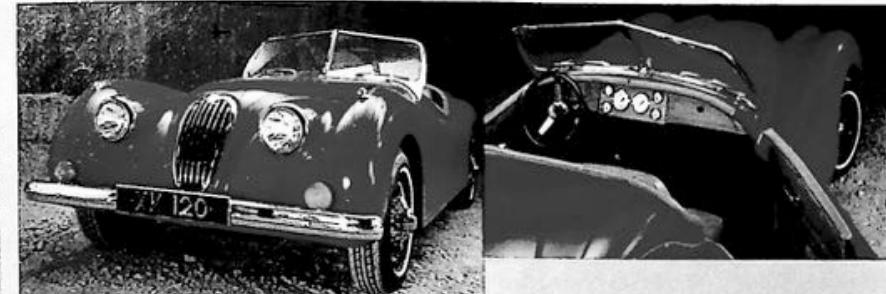
Note the nicely shaped front bumper, which is covered with a fabricated stainless steel skin. The bumper shape is one of the reasons for choosing the Monza as the base for the project.



The roof line, another criterion for choosing the Monza as the Blackstone base, blends in nicely with the elegant lines of the rear fender.



From this angle, the Seville-like slope of the rear trunk panel becomes more apparent. Stock trunk can be left in place if you need extra storage room.



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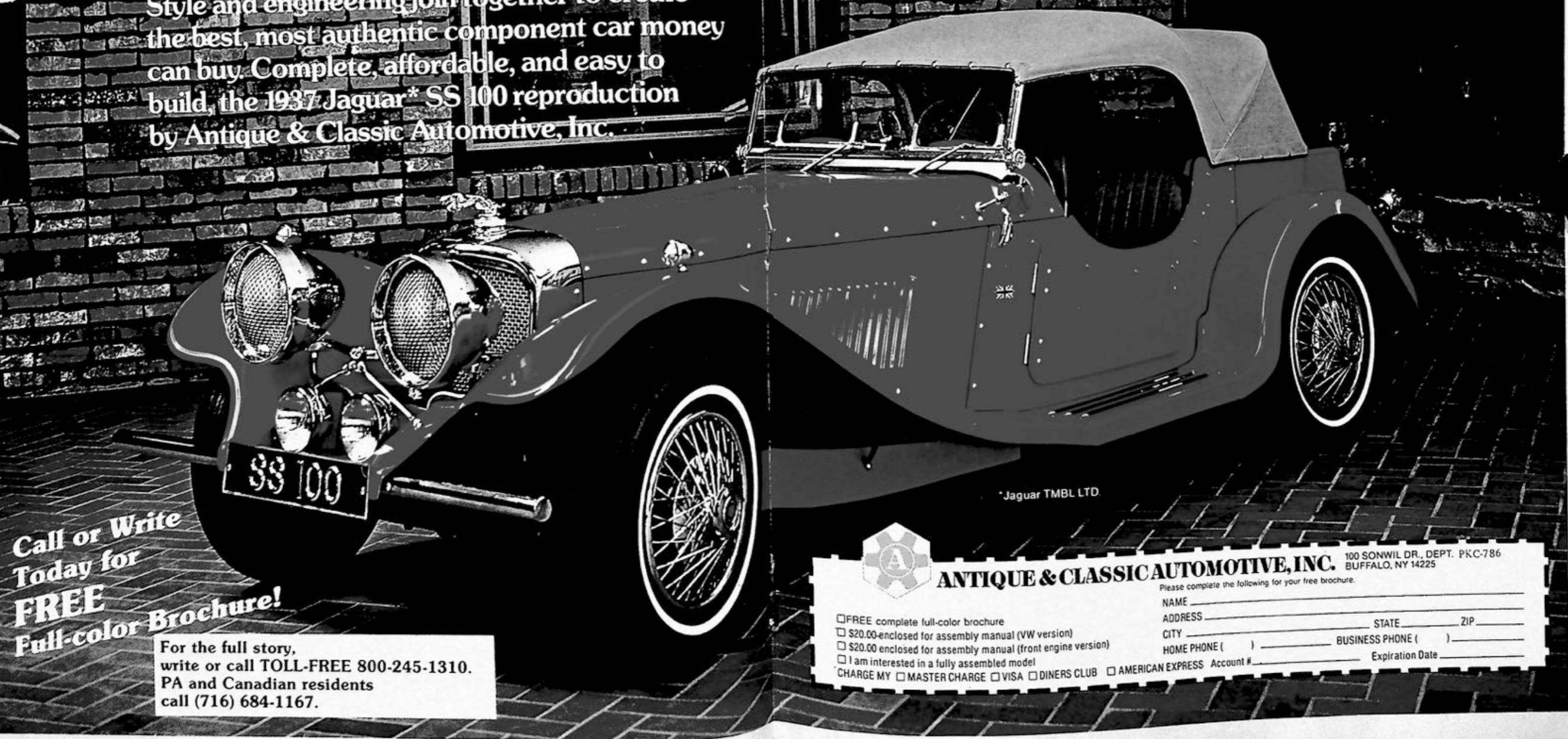
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# Immaculate Deception

## MROZ COACHBUILDERS' WEEKEND WARRIOR SPYDER

By Steve Stater

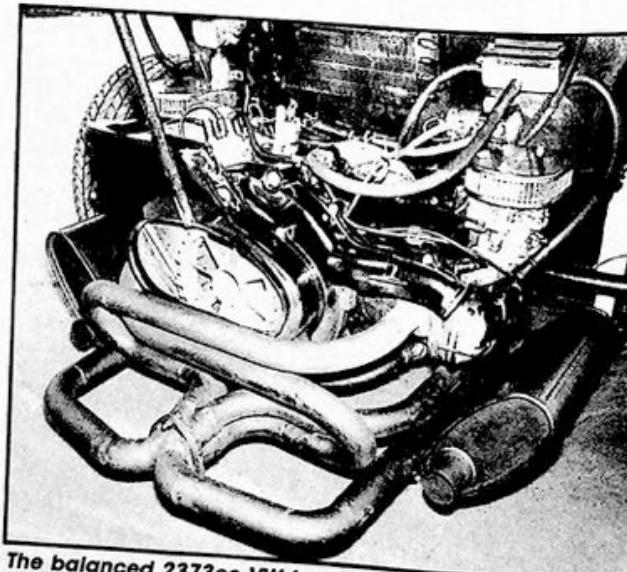
**T**HE ORIGINAL CONCEPT was to build a low-cost, extremely simple kit based on a stock Volkswagen chassis," recalls a loquacious Mark Mroz. "The body was essentially copied after the Glockler Porsche race cars of the '50s, although it isn't an exact duplicate."

Grinning, Mroz continues, "I did change and refine it from the original Glocklers a bit to bring it into the Eighties—style it a little." And style it has.

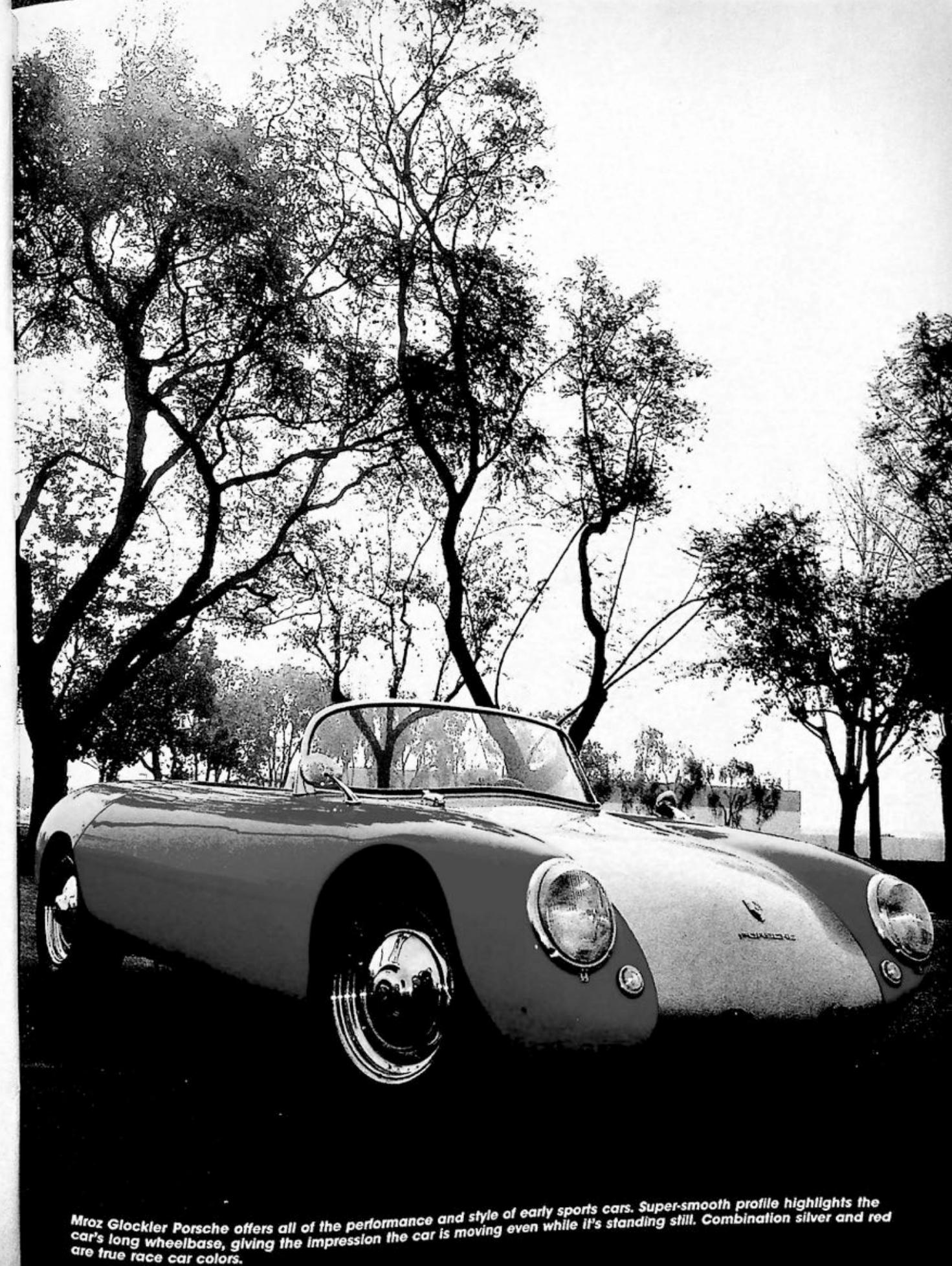
Mroz Coachbuilders (2584 E. Fender St., Unit F, Dept. KC, Fullerton, CA 92633) is the manufacturer of the Spyder kit—an artful mix of form, function and quality neatly enveloped in a one-piece fiberglass body. In street-ready form, it has a curb weight just shy of 1400 pounds. When you pack the back half of Mroz's weightless wonder full of Volkswagen Pferdestarke (horsepower), you don't have to be a slide rule jockey to figure out what will happen. It becomes a four-wheeled terror that'll catapult you up to the double-nickle faster than you can say "wunderbar."

The Spyder depicted here is Mroz's personal transportation and test bed for his firm. It's also a

Mroz Coachbuilders' Spyder kit is a lesson in simplicity. It's easy to assemble, maintain, and even easier and more fun to drive!



The balanced 2373cc VW four-cylinder was assembled by Ron Cagle using Auto-Craft pistons and barrels, Carrillo rods, Weber carbs and a Bosch ignition system.



Mroz Glockler Porsche offers all of the performance and style of early sports cars. Super-smooth profile highlights the car's long wheelbase, giving the impression the car is moving even while it's standing still. Combination silver and red are true race car colors.

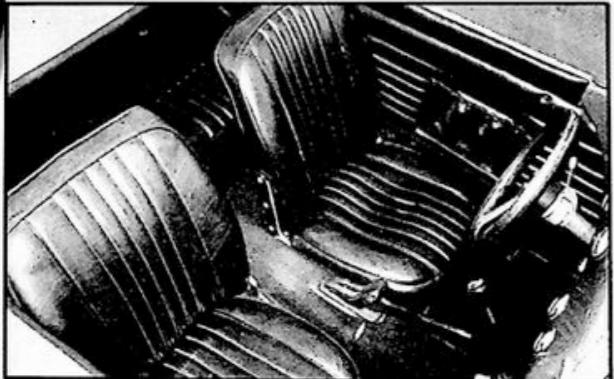
## Deception

shining example of the durability and roadworthiness of the Spyder design, with more than 21,000 trouble-free miles on the odometer.

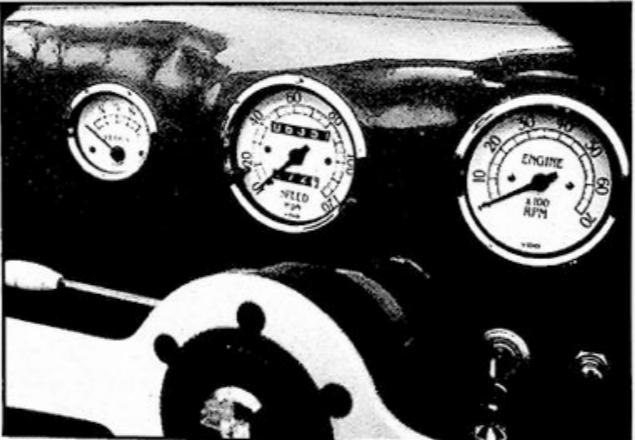
Beneath the pretty exterior is a '67 Volkswagen chassis, essentially unaltered except for the performance enhancement to ensure a high degree of street supremacy. A slight lowering of the suspension brings the Spyder closer to the ground where it belongs, while 15x5½-inch wheels encircled with Pirelli P6 radials contribute greatly to the car's upscale slot car handling. A combination of Koni shocks fore and Gabrels aft keep the rubber firmly on the road.

Measuring in at 2373cc, the air-cooled VW four-cylinder powerplant was skillfully assembled by Ron Cagile and plays host to a number of go-fast goodies. Among them is an 84-millimeter counterweighted crank, 94-millimeter Auto-Craft pistons and barrels and Carillo rods.

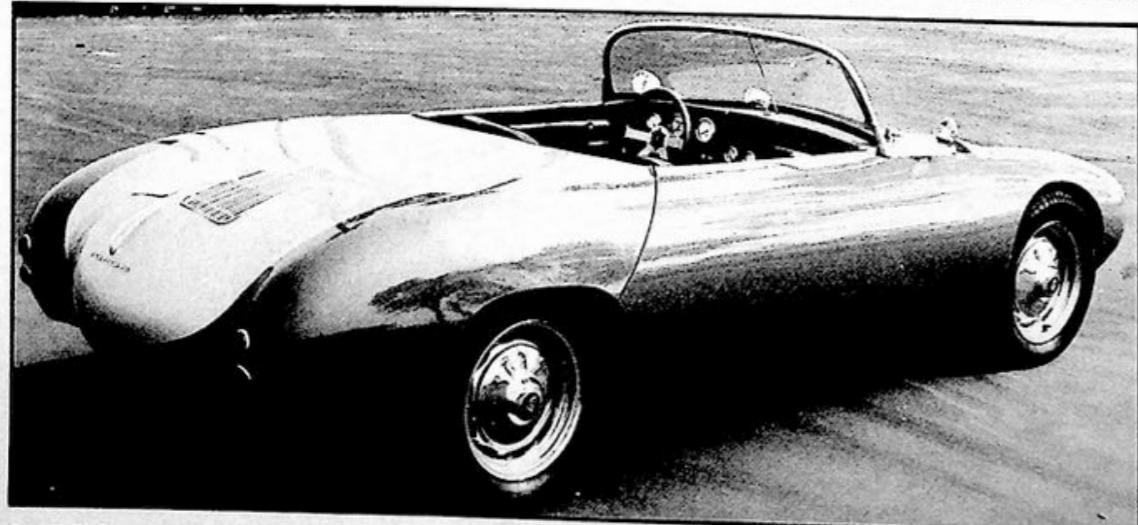
An Engle cam controls the valve action inside the modified dual-port heads (by Fumio), so the two 44 IDA Weber carbs can effectively supply the proper mix of air and fuel. A Bosch .009 distributor provides the spark before the custom-made header has a chance to scavenge exhaust fumes from the chambers. Precision Trans in Huntington Beach,



A pair of '66 Jaguar XKE bucket seats were found and covered in black Naugahyde to match the rest of the upholstery. Shifter and emergency brake are stock VW items and both are positioned in their original locations.



Vital operating information is relayed via VDO Vintage instruments lined up behind the Momo steering wheel.



54 KIT CAR

California, pieced together a stout, hard-hitting transaxle outfitted with heavy-duty side covers, a Super-Diff, Crown axles, close-ratio third and fourth gears and a 4:62 final drive ratio.

The Spyder's fiberglass body is well-made and needs little attention prior to applying the paint. All that's required is a small amount of careful prep-work and it's primed. The body's flowing, graceful form lends itself to a multitude of paint and graphic schemes—from a simple monochrome design to a lavish blend of graphic bands and colors. Mark's rendition is a happy medium—a striking two-tone done in a combination of bright red and glistening silver acrylic enamels.

The cockpit is as straightforward and unobtrusive as the rest of the Spyder, with barely enough room for a pair of bucket seats and a steering wheel. A blend of black Naugahyde and plush cut-pile carpet complements the VDO Vintage instrument cluster and wood-rimmed Momo steering wheel nicely.

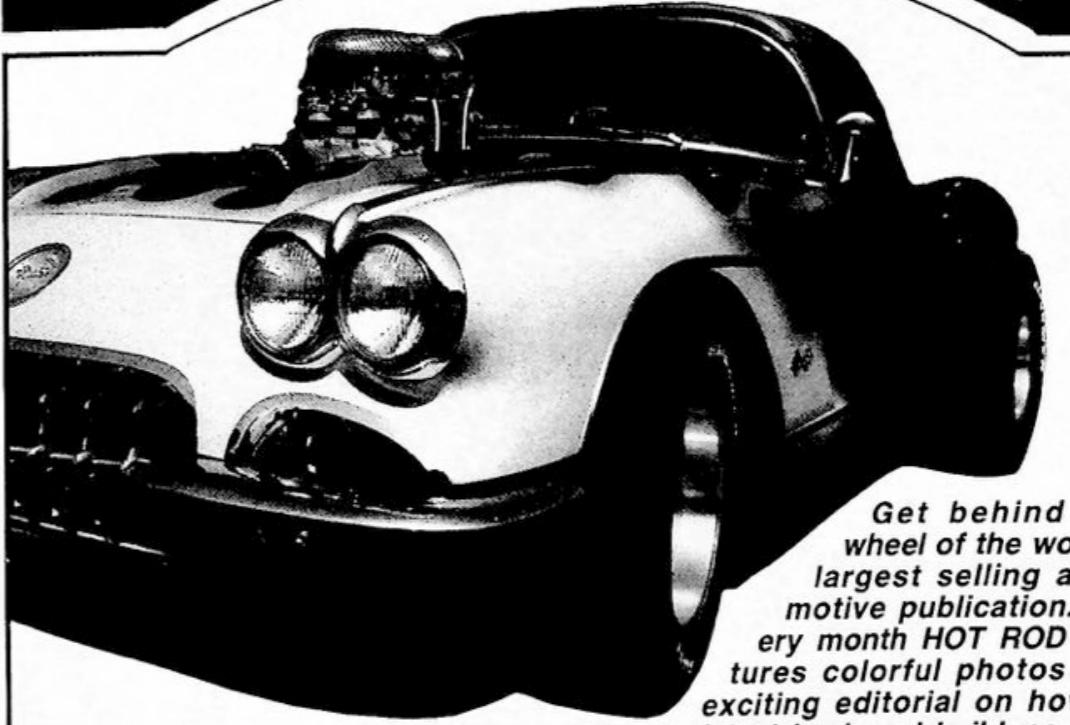
As for entertainment, there is the ever-present screeching of pavement-burning tires and high-speed winds. Surely an ensemble of sounds that, for those who can appreciate them, represent the ultimate rolling concerto.

By now you should be getting an idea of what the Mroz Spyder is all about. It's a fun-mobile, a weekend warrior, an ego-booster and a kick-in-the-pants asphalt toy. But above all, it's *affordable*. And that, my friends, is no deception!

KC

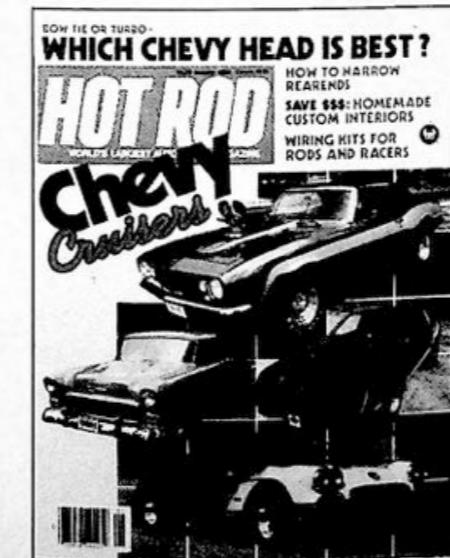
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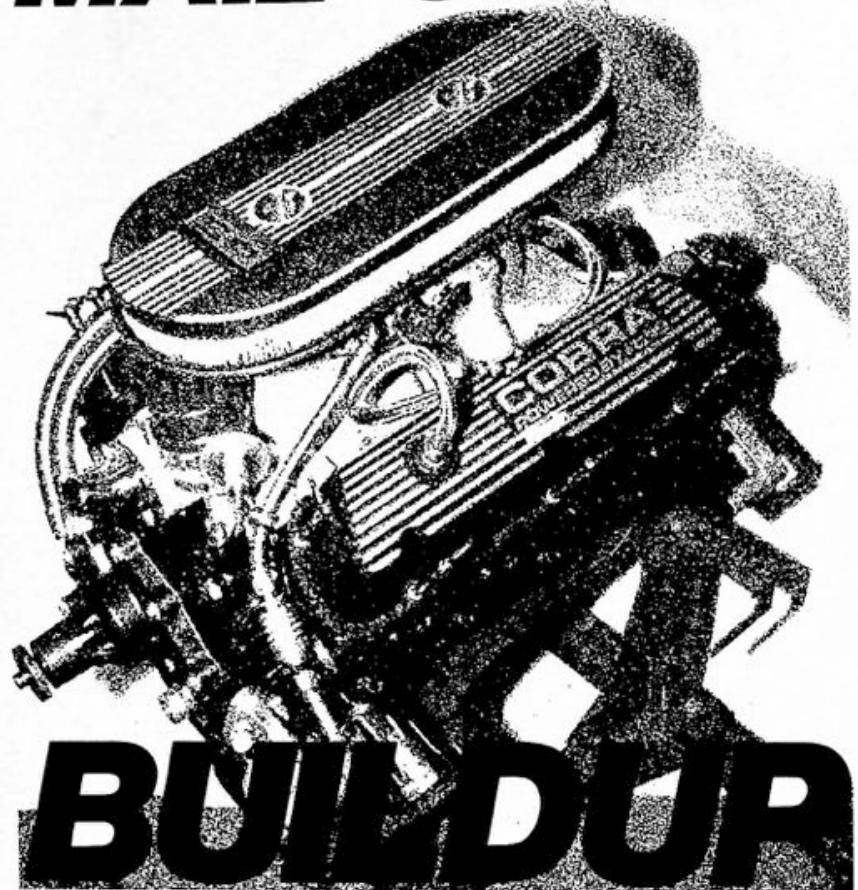


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# MAIL-ORDER



## WOULD YOU BELIEVE A KIT SMALL-BLOCK FORD V8?

By Dave Fults

**T**HE FORD SMALL-BLOCK V8 has been around for more than a few years and has enjoyed a good reputation for both reliability and performance. Kit car enthusiasts have also developed a fondness for the engine. The small-block is the favorite powerplant for the Cobra replica crowd and can be modified to provide more than enough horsepower to keep the vast majority of the motoring public happy. Remember, the original Cobras that rolled out of Carroll Shelby's Santa Fe, California, plant were powered by 260-cubic-inch small-blocks.

Of course, other kit car manufacturers have stuffed the little Ford V8 into their products as well, while many use the Pinto/Bobcat/Mustang II as a donor vehicle. The small-block Ford is the answer for the kit car builder in search of high-performance. The motor mates easily with most of the popular drivetrain and suspension components now in use, and more often than not contributes to a peppy, well-balanced vehicle. Thoroughbred Motorcars lists

the small-block Ford V8 as the recommended powerplant for its 540K replica, as does the majority of '57 T-bird replica makers. Additionally, we have seen the little Ford sitting in everything from mid-engined Mantas to Jaguar XK120 replicas.

Although some of the available small-block Fords still have many miles of service life left in them, the majority have seen better days. If the motor you have planned for your project is in need of a little freshening up, Performance Automotive Wholesale (19441 Business Center Dr., Northridge, CA 91324, 818/993-7440) has a lot to offer.

PAW specializes in serving the mail-order customer with the best in high-performance engines and accessories. The firm's catalog showcases an unbelievable array of just about anything you might need for your motorized masterpiece. PAW's "kit" engines are perfect for the kit car enthusiast who is building his car via the next delivery of the U.P.S. truck.

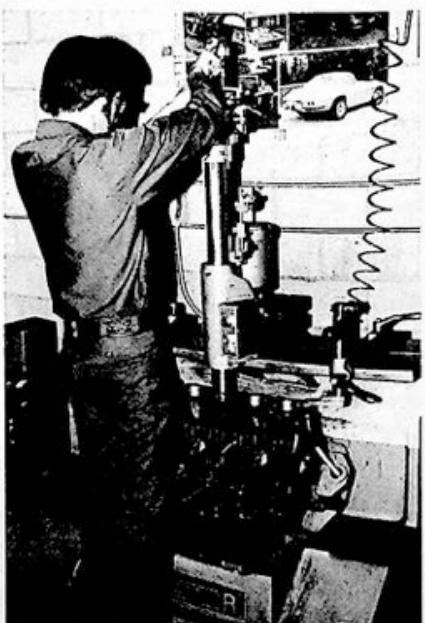
The PAW kits are so complete that

very few additional items are required for completion of the engine. This allows the kit car enthusiast, who happens to be building his car in East Nowhere, Nebraska (no offense, Nebraska), to obtain the same high-quality parts that the guy in a major city can. It also allows the builder who has little or no mechanical experience to build his own engine without a lot of hassle or expense. Just buy yourself a good factory service manual, read it carefully and everything should work out fine. Besides, the experts at PAW are never more than a phone call away. PAW will also sell its motor packages on an outright basis and there is no core charge, so you don't have to send your old greasy motor back to them.

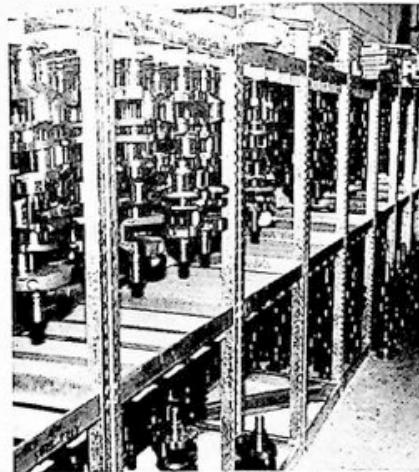
PAW can tailor a motor package to fit just about anyone's needs. For example, if you want your engine to have a low compression ratio because you plan to install a turbocharger, go to PAW.

With all of this professional help, the construction of our project motor turned out to be a pleasurable experience. The machinework was outstanding (we checked every conceivable clearance and measurement requirement and found everything to be well within factory tolerances). As with any engine buildup, though, the most important thing to remember is to take your time and make sure everything fits properly so it will function correctly.

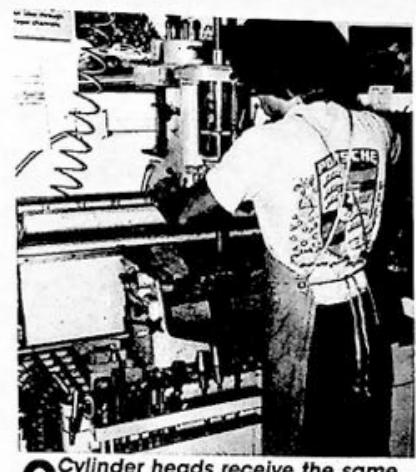
Take a look at what we did, and if your kit car's present motor is in need of a little tender loving care, take heart, the answer may be as close as your mailbox.



**A** PAW takes advantage of a modern machine shop to ensure that its mail-order parts and engine kits are of the highest quality. All work is carefully inspected prior to shipment.



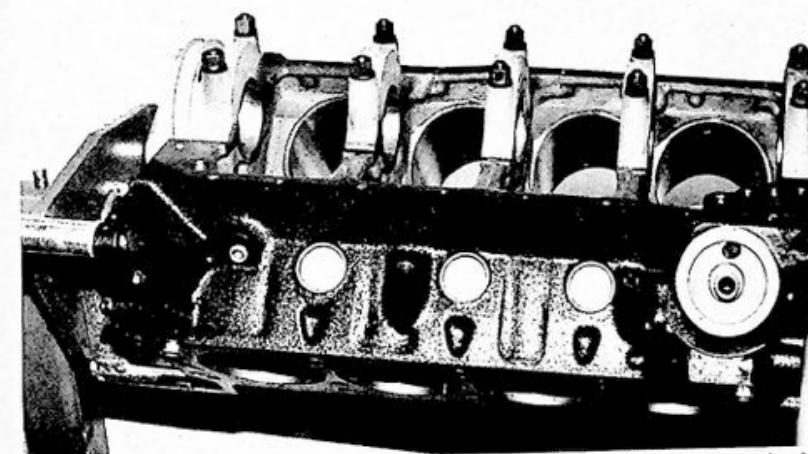
**B** PAW buys everything in bulk and performs all machine work on the premises. This means that PAW will have what you want when you want it and at a reasonable price.



**C** Cylinder heads receive the same thorough attention given to the engine blocks. Everything from basic low-compression heads to the more exotic castings are available from PAW.



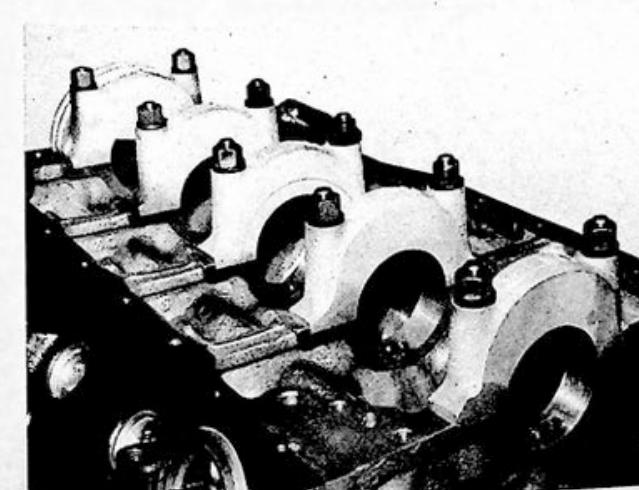
**D** Engines that are ready for shipping are wrapped in a plastic bag and placed in wooden crates. The whole package is then enclosed in heavy cardboard and shipped to the customer.



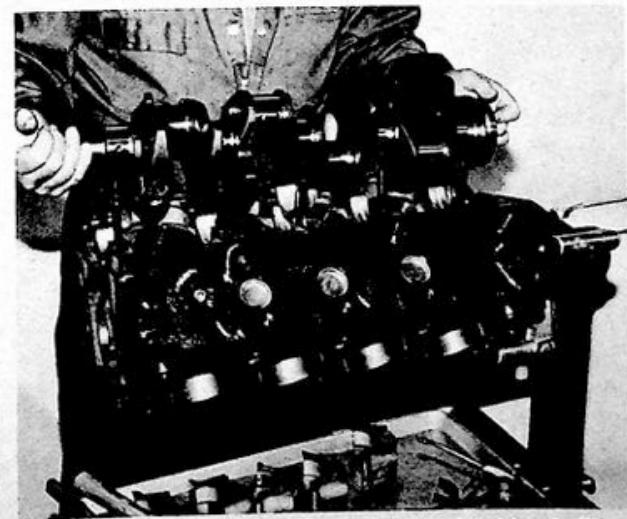
**1** The small-block Ford V8 has always been a popular kit car powerplant. The motor used in our buildup is a Mexican 302 block intended for installation in a 427 Cobra replica. As delivered from PAW the block is line-bored, engine-decked and bored .030-inch over.



**2** The first step in any engine transplant should be to inspect the block for damage. Afterwards comes a basic cleanup, including flushing the oil galleries and running a hone through the lifter bores. The bolt holes are cleaned with a tap then the entire block is treated with light oil to prevent rust.

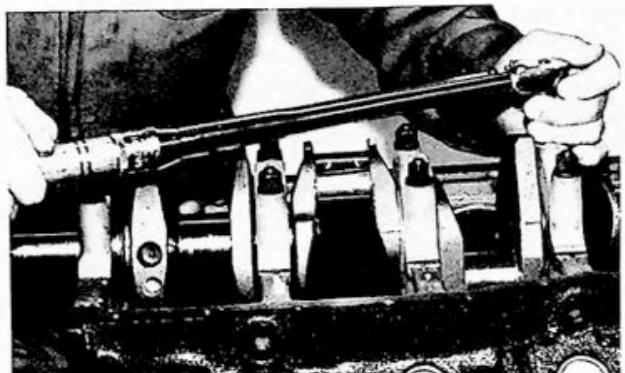


**3** Our 302 has large bearing caps for additional strength. The caps display numbers and arrows to ensure proper installation. The Mexican 302 block is perfect for any high-performance application and is available on a limited basis from PAW.

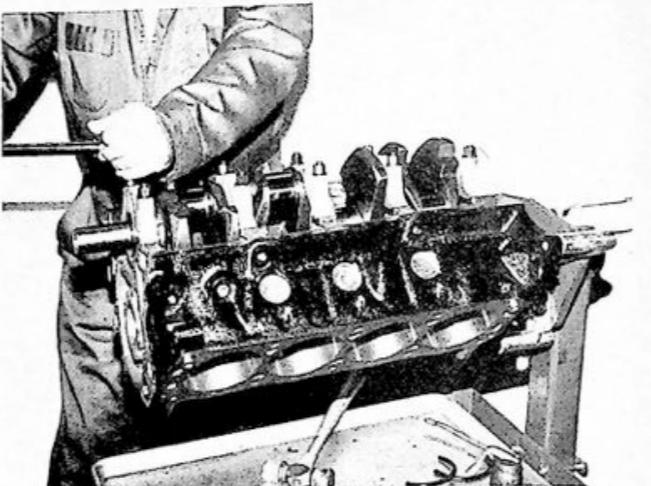


**4** Install the crankshaft bearings (they should only fit one way), then carefully slide the crankshaft into position.

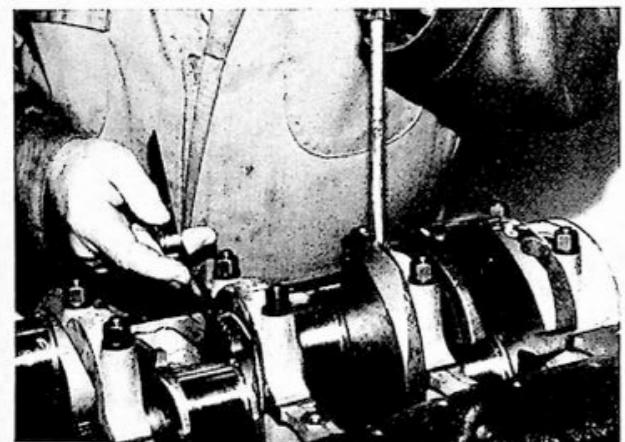
# BUILDUP



**5** The next step is to measure the bearing tolerances. Apply Plastigage to the crank journals and install the main bearing caps. Remove the caps and check tolerances. If everything is okay, you can reinstall the crankshaft. Carefully clean journal and bearing surfaces.



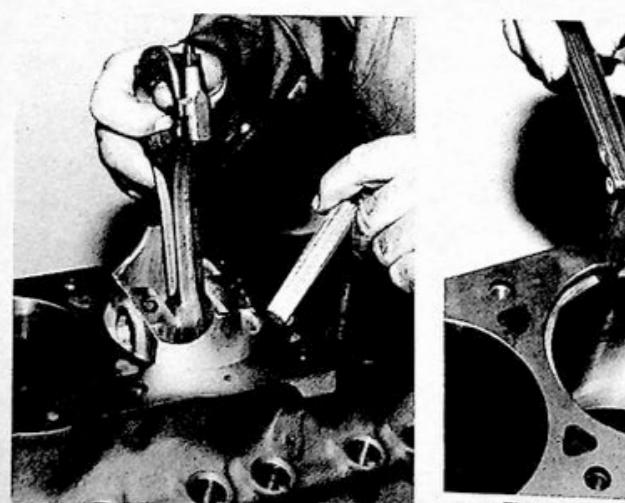
**6** Lubricate bearings and crank, position rear main seal and carefully reinstall crank. Install bearing caps and torque to recommended specifications. Our motor requires 60-70 ft.-lbs.



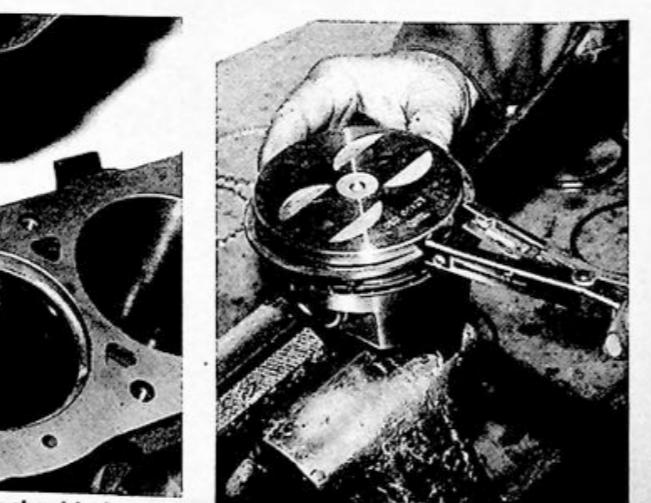
**7** Crankshaft bearing endplay must also be checked. Bearing clearance should be between .004-.008-inch, but again check the factory manual for your particular application.



**8** TRW forged aluminum pistons were supplied with our PAW package. Again, inspect each part for damage before assembly begins.



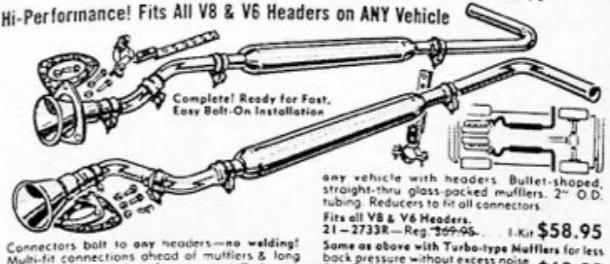
**9** The pistons must be test fitted in their bores to ensure proper clearances. The Ford 302 requires between .0018-.0026-inch clearance.



**10** The piston rings should also be checked in their respective bores. Our rings were perfect in the middle of the .015-.025-inch recommended tolerance.

**11** Extreme care must be taken when installing the rings. Begin with the bottom oil control ring and work your way up.

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# BUILDUP



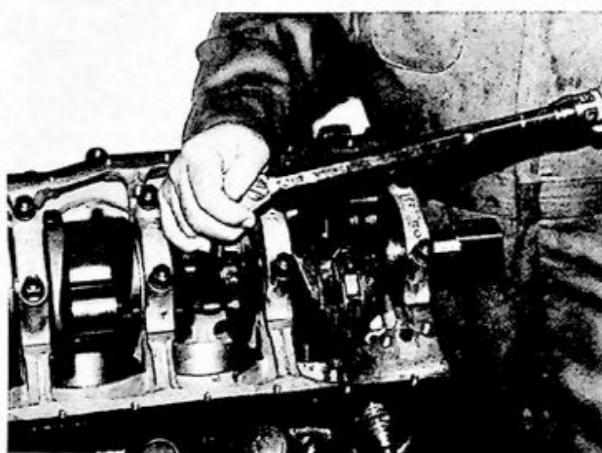
**12** Install the rod bearings and lubricate them with the kit-supplied grease. Marking the rods and their caps will ensure that the parts will not be mixed up during a later engine rebuild.



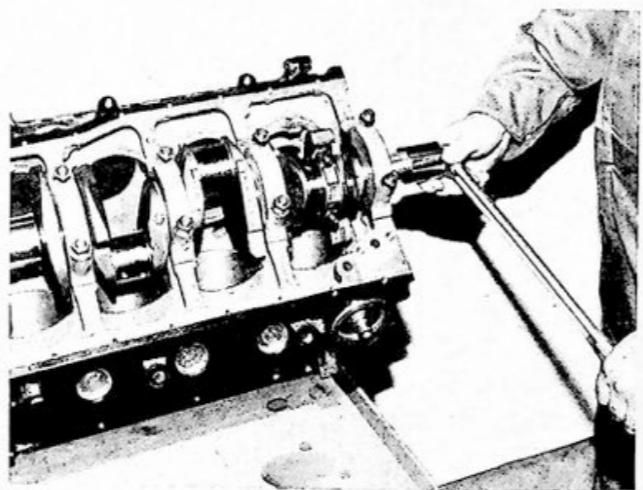
**13** Bathe each piston in a container of clean oil (a coffee can works great), then install the rubber boots on the rod bolts. The boots will protect the crank journals from damage during piston installation.



**14** Using a high-quality ring compressor, install each piston in the bore it was test fitted in. Take your time as piston rings are very fragile. Notice how the rubber boot on the rod bolt barely touches the crank journal.



**15** The rod caps are installed next and torqued to specifications. The installation procedure calls for the piston rod caps to be torqued down in three steps. Our motor requires a final torque setting of 40-45 ft-lbs.



**16** Check for any binding by turning the crank over after each piston is installed. If any is found, disassemble the part immediately and find the cause.



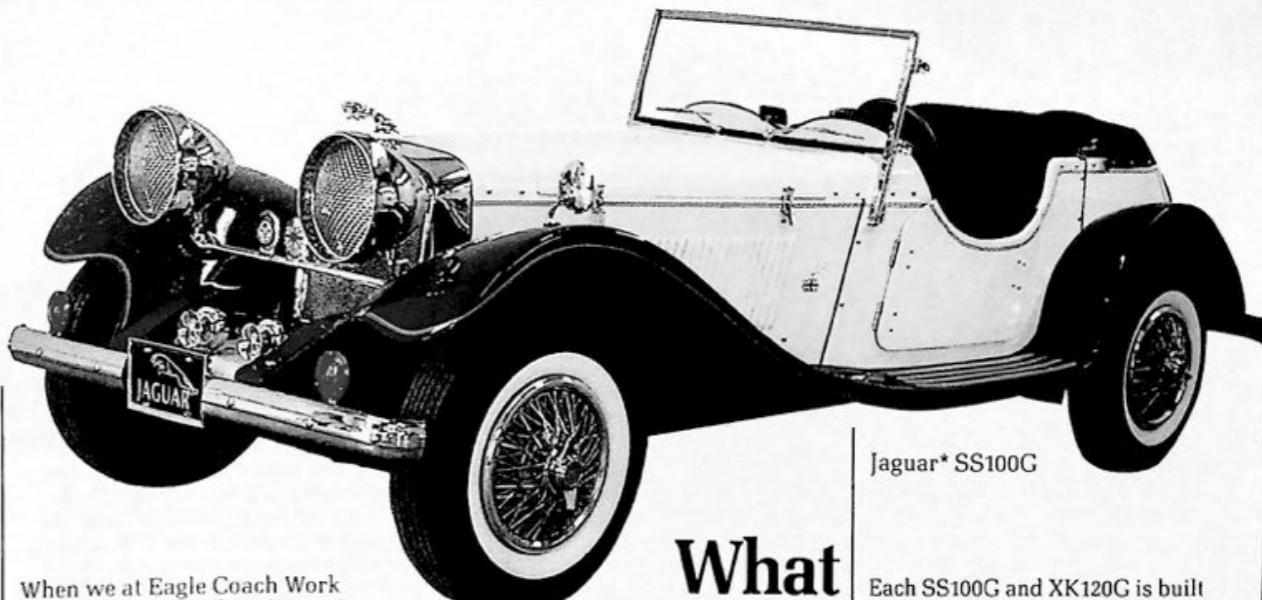
**17** With all of the pistons installed, it's now time to move on to the camshaft. We ordered a Crower compucam (part No. 15211) for our Cobra motor. Apply an even coat of Crower cam and lifter prelube to all surfaces.



**18** Carefully slip the cam into the block and install the camshaft thrust plate. The thrust plate only fits one way so make sure you have it positioned correctly. Check cam to see that it spins freely in the block.



**19** The timing chain assembly can now be installed. Install crank gear first, then align gears and slip cam gear onto camshaft. Don't forget to install the crankshaft oil slinger.



Jaguar\* SS100G

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 \$17.50 XK120G Assembly Manual

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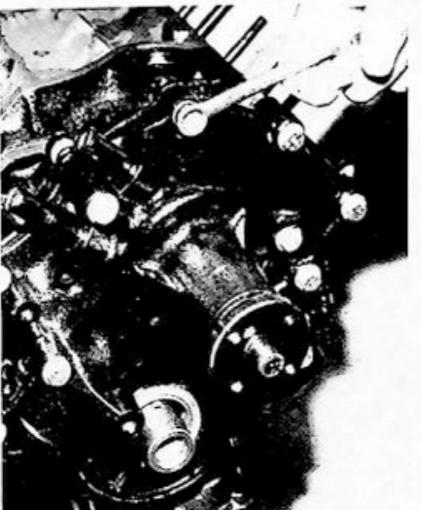
Exp. Date \_\_\_\_\_

\*Jaguar TMBL LTD.

## BUILDUP



**20** Install a new oil seal in the front cover and position the cam cover on the block.



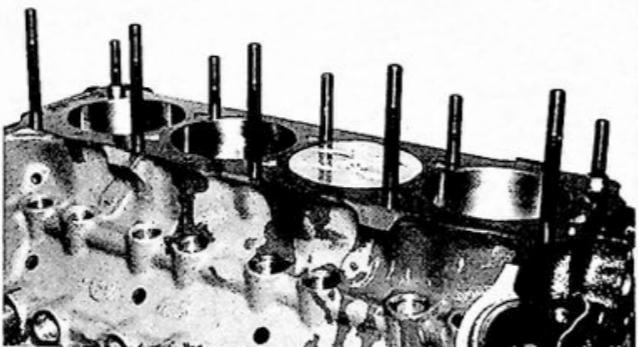
**21** The water pump is installed next and the cam cover bolts are tightened down to specs.



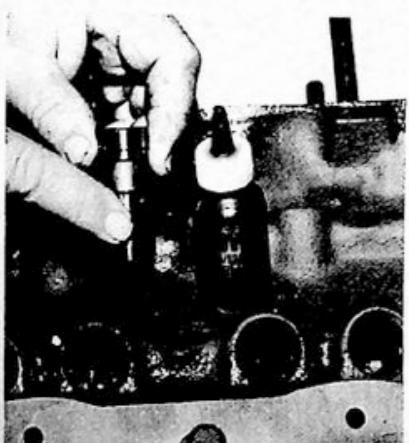
**22** Our motor is equipped with a Moroso deep-sump oil pan, so the new oil pump is fitted with an extended pickup tube. It is a good idea to check oil pump operation before installation.



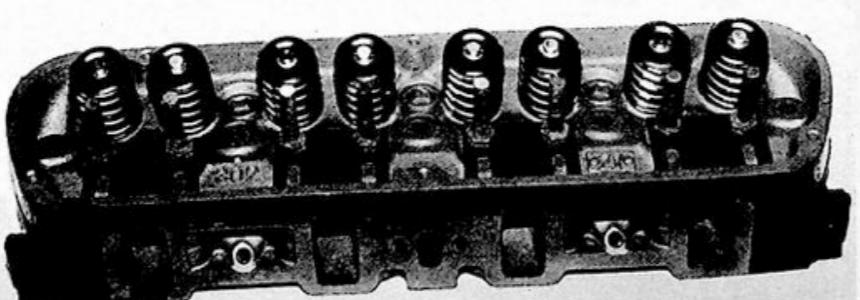
**23** The fuel pump goes in next. Make certain the gasket surface is clean or leaks will occur.



**24** Moving up top, the next procedure is installing the heads. This involves installing the studs in the block. Be sure to use some type of sealant on the studs and that each stud is installed at the same height.



**25** Prime the hydraulic lifters with clean motor oil before installation, then thoroughly coat each lifter with prelube. Don't forget to apply lube to the lifter bores as well.



**26** Our PAW motor package included a set of '68 302 heads. The heads have 1.94 intake valves, 1.50 exhaust valves, optional guide plates and custom headwork.

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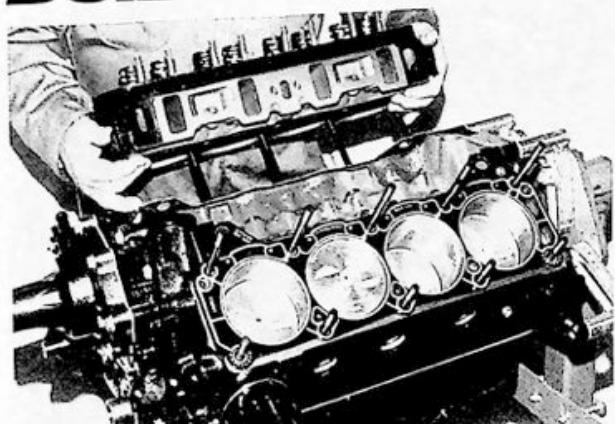
Each month CAR CRAFT provides you with the information you need to be the best on your block! Read the latest technical information presented in easy to understand editorial; helpful how-to's for beginners as well as advanced enthusiasts; our experts offer cost-cutting advice for building the meanest street machines; plus colorful action photos of the wildest supercars on the road today!

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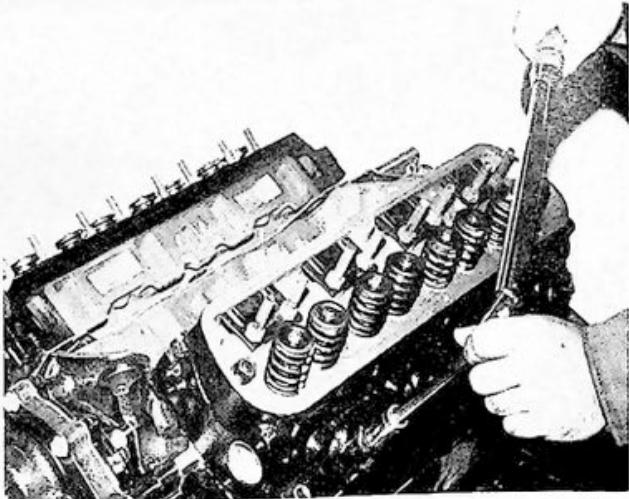
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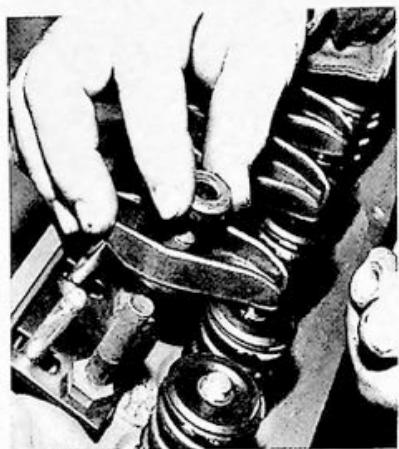
## BUILDUP



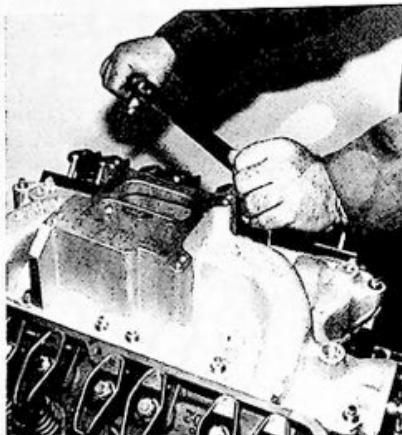
**27** Position the head gaskets in place (the studs make this job easy), then give the cylinder bores one more inspection before you install the heads.



**28** The heads require the same progressive tightening procedure as the main bearing caps. You should consult your engine's shop manual for its specifications and tightening sequence.



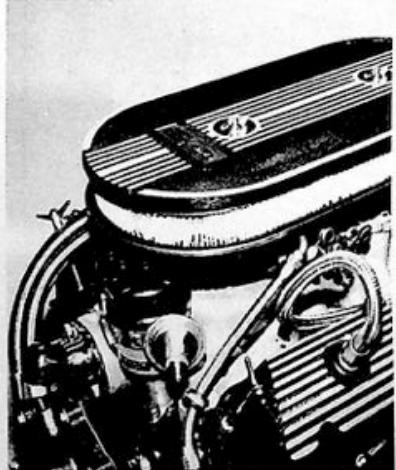
**29** Slide the new pushrod into place and install the rocker arms. Be sure to use the pivot washer before installing the retaining nut.



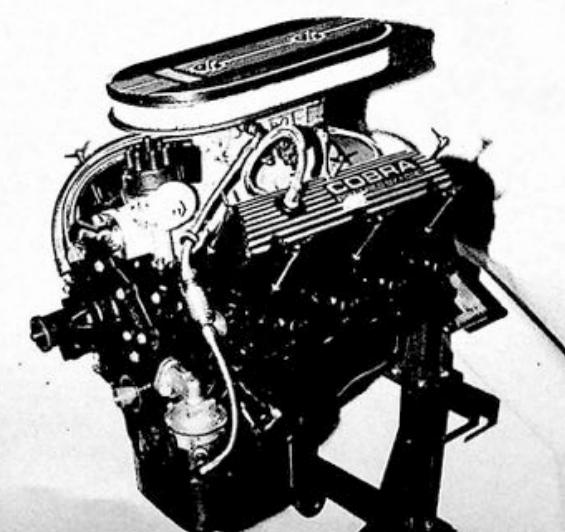
**30** A Weiland aluminum high-rise intake manifold was chosen for our motor. The 2P-189-degree intake manifold was recommended by PAW.



**31** The old standby Holley four-barrel carburetor, in this case a 650cfm model.



**32** Cobra valve covers and air cleaner housing add a little class. What better for a Cobra replica?



**33** Complete? Well, almost. After the addition of a few minor accessories, our powerplant will be ready to do its job under the hood of a Cobra KC.

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# Plain



# Wrapper

## A NEWCOMER COBRA THAT'S READY TO STRIKE

*Text and Photography By Bob McClurg*

**W**HEN SAN DIEGO, California, architect Frederic Newcomer decided to build a Cobra replica, he knew exactly what the car was going to be like even before he began the project. Fred's Cobra had to be fast, comfortable and self-supporting. Or, simply put, the Cobra must be fully equipped.

Fred is an automotive enthusiast. He's owned such famed makes as Ferraris, Corvettes, Mercedes-Benzes, Austin-Healeys and many more. Since the completion of his Cobra, he's logged more than 8000 miles in four months, and at least 2000 of them were within the first few weeks alone.

Newcomer purchased his Contemporary Classic Cobra replica from R.A.C.E., Inc. in Pomona, California, and brought it to Don Borders at Borders Mustang Affair in nearby San Marcos to assemble. Don started the Newcomer/Cobra buildup by painting

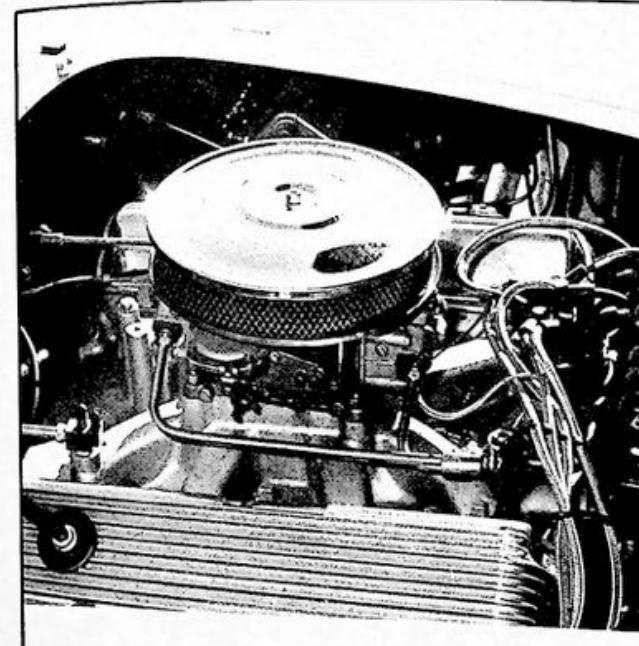
the Cobra chassis in black Imron. Then he attached the Jaguar XKE IRS front and rear suspension to the frame, but not before the components were outfitted with Delron bushings from Global West, Inc. Braided stainless steel brake and fuel lines were also added, along with a set of Koni coil-over shock absorbers and Contemporary's heavy-duty anti-sway bar. Also courtesy of Contemporary are the aluminum, Halibrand-style alloy wheels encircled by B.F. Goodrich (325/60x15 rear, 295/50x15 front) T/A radials.

Stuffed between the Cobra replica's frame rails is a Borders-built, 427 Ford low-riser engine. The big-block was balanced, decked and blueprinted as well as having the low-riser heads and Holley Dominator intake manifold port-matched for better fuel delivery. Mostly Ford Motorsport internal components were used in assembling the engine (Le

Mans rods, a cross-drilled steel billet crank and a Ford cam) along with TRW pistons and an FPP/Melling high-volume oil pump. A Mallory ignition and Champion spark plugs ignite the high-octane fuel delivered by a single Holley 3310 double-pumper four-barrel. The headers are Contemporary units.

Borders also assembled the Ford Top-Loader four-speed using a Hurst shifter and linkage. Friction material to make those lightning-fast gear changes (11½-inch clutch and aluminum flywheel) are supplied by McLeod.

Don primed Newcomer's Contemporary fiberglass 427 SC body and sprayed it in a very low-key, Chevrolet white acrylic lacquer. Tasteful sprinkles of

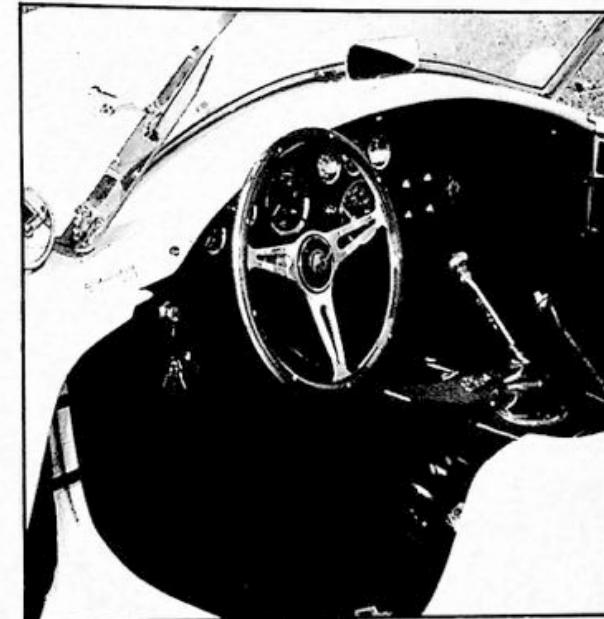


*The Cobra's venom comes from a Don Borders-built 427 Ford low-riser big-block. A host of Ford Motorsports components are used along with a Holley carb and Dominator manifold.*

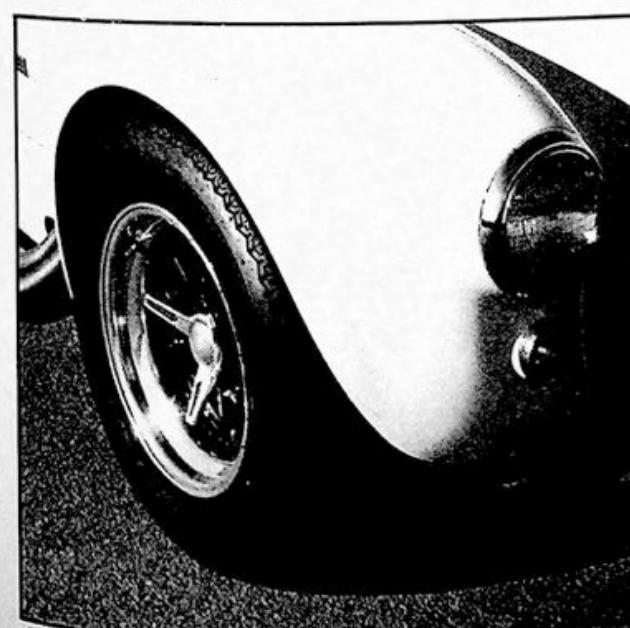
chrome help bring out the shine. To most people this car may look just like any other Cobra, but others will notice the six-foot-tall fiberglass whip antenna mounted on the decklid—which is a clue to what this car is all about.

Inside the black-on-black Connolly leather and Wolton carpet interior is a multitude of electronic gadgets. Among the inventory is an Alpine stereo with four-way JBL coaxial speakers, a 40-channel Cobra (naturally) C.B. radio and a Fox radar detector with the sensor mounted inside the right front fender. With all of this hi-tech gear onboard, long trips are quicker, with less hassles and, according to Fred, that's what pleasurable driving is all about.

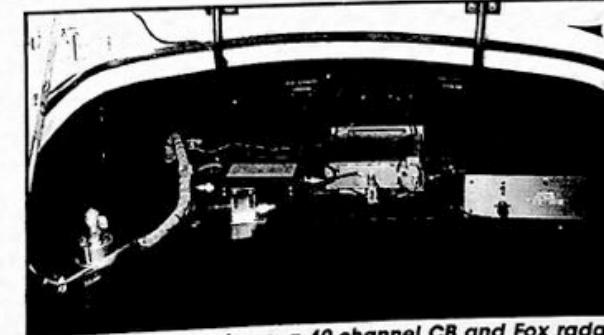
**KC**



*A Hurst shifter connects to a Top-Loader four-speed gearbox equipped with a McLeod clutch and pressure plate. Smith instruments monitor vital engine functions, while an Alpine AM/FM cassette deck paired with JBL speakers provides entertainment.*



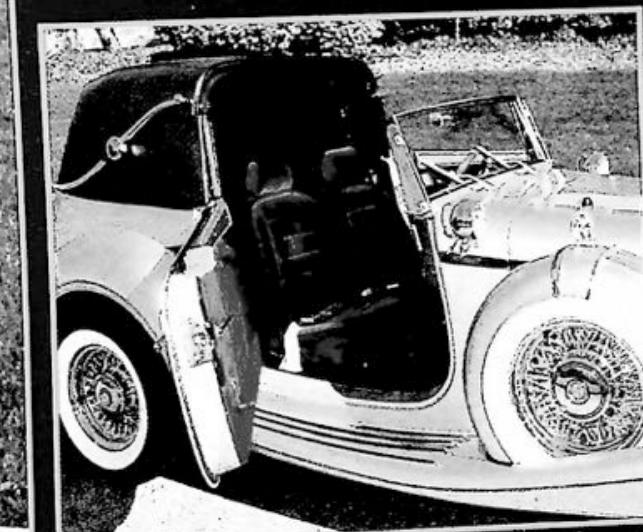
*Jaguar Independent front and rear suspension ensures a high-degree of road-hugging ability. Contemporary's Halibrand-style wheels are paired with B.F. Goodrich radial rubber.*



*In addition to the stereo, a 40-channel CB and Fox radar detector take up room in the trunk, adjacent to the foremost bulkhead, and are readily accessible from between the front seats.*



# Family Classic



Thoroughbred Motorcars has really done its homework when it comes to offering its customers lots of luxury. 540K has all the comforts of the world's great cars. Notice how the carpet edges are all nicely finished. Tilt wheel, full instrumentation and cruise control make driving this car a special pleasure.

The ultimate family kit! 540K four-seater has lots of legroom for back seat passengers, and a removable roof panel gives the car a limo-like quality. Suicide doors speak for themselves.

## MERCEDES-BENZ 540K FOUR-SEATER

Text and Photography by Bob McClurg

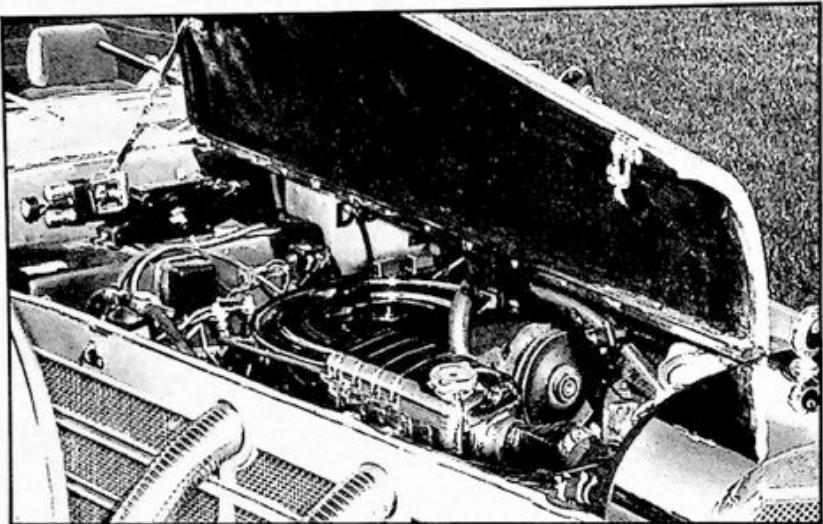
**E**LECTRICAL CONTRACTOR JOHN Mesure of Woodland Hills, California, decided a few years ago that it was time he take on an automotive building project that would not only give him a lot of satisfaction, but also take his mind off business. Mesure has been a specialty car enthusiast for many years but, like many people, his hands-on experience is limited due to the old 9-to-5 job.

The car pictured here is John's escape machine. It's a Thoroughbred Motorcars 544K, which is a variation of the 540K, but seats four. This particular vehicle is one of the first completed 544Ks, and was featured in *KIT CAR Magazine's* September, 1984

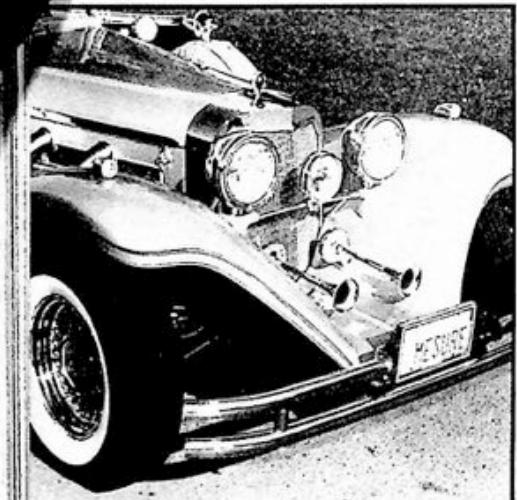
# Family Classic

"Garage Scene U.S.A." section prior to its completion. Construction took eight months, and John says he couldn't have done it without the assistance from his son Brett and Ray Garrish's Astro Designs crew.

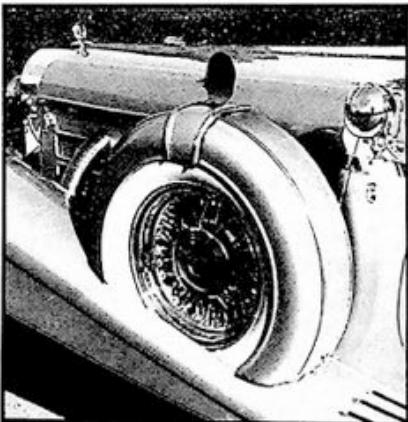
Since this was Mesure's first attempt at assembling a kit, he followed the manufacturer's directions to the



Dependable small-block Ford provides smooth motivation for Thoroughbred's four-seater. Drivetrain remains stock but along with engine compartment has received a thorough cleanup.



Impressive 544K front is a shining example of good craftsmanship.



Twin side-mount spare tires are saddled with fully finished hard covers. No detail has been overlooked—not even the spare mounted rear-view mirror and remote controlled spotlight.



The K's rear end appears a bit bulky, but all is not lost as it still has some classic style lines. No storage space problem in this car, either. Rub stripes and lots of chrome are more testimony to car's elegance and high quality.

letter. The first step was to locate a wrecked 1975 Mustang II, carefully disassemble it and save all of the suspension, drivetrain, steering and electrical components. These pieces were rebuilt, then installed on the 544's chassis.

When it was time to rebuild the engine, John selected a 289 short-block rather than using the worn-out 302 that he had salvaged from the donor car. The engine was outfitted with all TRW replacement parts and topped off with an Edelbrock aluminum intake manifold, a Holley 660 cfm four-barrel, Holley valve covers and a Mallory 90-degree distributor. Conventional air conditioning was also a prerequisite for the new 544, but due to lack of space

under the car's long, narrow hood, a special unit made from Monte Carlo components had to be adapted.

After the car was assembled and road tested, John delivered it to Astro Designs where Garrish and his crew methodically block-sanded the fiberglass body for the smoothest surface possible before applying the silver paint. Dennis Bryant from Class & Color Autobody sprayed on the Mark IV moondust silver paint and added a diamond dust overcoat. The results are spectacular!

Upholsterer Ed Scully covered the interior in lavish

# MG TD

## buyers' guide

### BRITISH INVASION

By Steve Stater

**T**O MANY AUTO enthusiasts, the letters MG are synonymous with the words sports car. To others, these two consonants are the signature of the world's first and only true sports car. And with good reason. Amidst discussions of legendary cars, inevitably the MG comes to the forefront.

As every sports car connoisseur must know by now, the name MG was taken from its parent company, the Morris Garages of Oxford, England, owned by Sir William Morris. The Morris Garages sold and serviced cars and motorcycles several years before they began to manufacture automobiles. By the late '20s, the MG Car Company was established and the vehicles it produced were a viable force on the roadways of England. MGs were popular with club racers during that era and were successful when competing in speed trials, rallies and even endurance races.

When the sports car movement first hit the United States in the late Forties, it was the MG-TC that set parameters of what a sports car should be. From 1950 to 1955, MG exemplified the meaning of upscale slot car handling in the form of the TD, the TD Mark II, the TF, the TF 1500, and then capped it off with the MGA.

The diminutive two-seat roadsters were fun to drive, inexpensive and a bit of an oddity in a marketplace solely interested in commuting. They were simple in design, form and function, therefore, few gadgets could go wrong. While manufacturers, both domestic and abroad, were streamlining their vehicles, the MG retained a classic flair that never went out of style. Its flapping fenders and open-air elegance held over from the Thirties is what made the MG a formidable mode of transportation. And enjoyment grew with the accumulated miles.

However, the MG's popularity has far outlived its availability. Today, its scarcity and beauty command a price tag nearing the stratosphere—that is if you can find a salvageable one. Well, thanks to today's quality-minded body builders, there is a multitude of



first-rate reproductions of the celebrated MG two-seat roadster. Many manufacturers go to great pains to create the proverbial mirror image of the original. Some are so well-duplicated, so exacting in every respect, that the average person would never be able to tell the two apart.

Because there is such a diversity of manufacturers producing these timeless two-seat sports cars, there is also a variety of drivetrains and powerplants from which to select. Almost all are based on the rear-engined Volkswagen chassis, which luckily does not have to be shortened (as is the case with Porsche Speedster replicas). However, the shifter and VW pedals are relocated rearward since the driver and passenger seats are placed farther back on the pan.

Many replica makers also offer traditional front-mounted engines with corresponding chassis and drivelines as options. Regardless of which driveline you choose for your reproduction, rest assured that any modern drivetrain is far less troublesome and, therefore, more dependable than the original (circa-1950) MG mechanicals.

The accompanying reproduction roundup is devoted entirely to the legendary MG series. It will undoubtedly steer you in the right direction, give you some insight into the repro world, and hopefully put you behind the wheel of your very own immaculately appointed "vintage" classic.

# MG-TD buyers' guide



**B.S.C. CORPORATION**  
425 Industrial Dr.  
Bremen, IN 46506  
(219) 546-3791

**Purchase Information:**  
MG-TD replica. Two separate component packages available.

**Construction Details:**  
Body bolts onto an unshortened Volkswagen chassis. A front-engine model is offered that is based on a rectangular tube framework.

**Powerplant:**  
Volkswagen or Chevette four-cylinder and all applicable transmissions.

**Suspension:**  
Volkswagen front and rear. The front-engine model employs an independent GM, rack and pinion steering and solid rear axle. Disc brakes front, drums rear.

**Body:**  
Fiberglass with double-wall construction. All hinge latch and mounting points reinforced. Painted in your choice of colors.

**SPECIFICATIONS:**  
Length ..... 148 inches  
Width ..... 58 inches  
Height ..... 51 inches  
Wheelbase ..... 94 inches  
Track, F/R ..... 49/49 inches  
Weight ..... 1800 pounds  
Price ..... \$6995  
Information package free



**CLASSIC MOTOR CARRIAGES, INC.**  
16650 N.W. 27th Ave.  
Miami, FL 33054  
(305) 625-9700

**Purchase Information:**  
MG-TD replica. Two separate

component packages available.

**Construction Details:**

Bolts onto an unshortened Volkswagen chassis. A front-engine model is available that is based on a jig-welded, parallel ladder-frame design made of two-inch rectangular tubing.

**Powerplant:**

Volkswagen, Pinto/Mustang II or Chevette four-cylinder and all applicable transmissions.

**Suspension:**

Volkswagen front and rear. Front-engine model features independent Pinto/Mustang II, rack and pinion steering and a solid rear axle. Disc brakes front, drums rear.

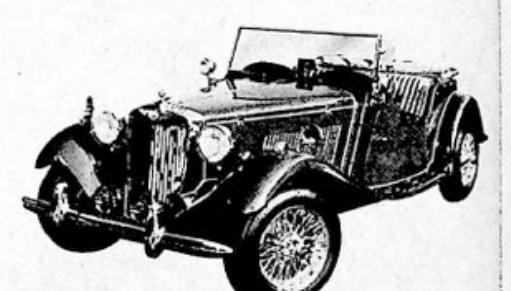
**Body:**

Hand-laminated fiberglass reinforced with steel. Supplied in your choice of gel-coat colors.

**SPECIFICATIONS:**

Length	148 inches
Width	58 inches
Height	51 inches
Wheelbase	94 inches
Track, F/R	49/49 inches
Weight	1800 pounds
Price	\$6995

Information package free



**CLASSIC ROADSTERS, LTD.**

1617 Main Ave.  
Fargo, ND 58103  
(701) 293-8866

**Purchase Information:**  
MG-TD replica. Two separate component packages available.

**Construction Details:**

Body bolts onto an unshortened Volkswagen chassis. A front-engine model is available that is based on a parallel ladder-frame design made of 2½-inch rectangular tubing, similar to the original MG design.

**Powerplant:**

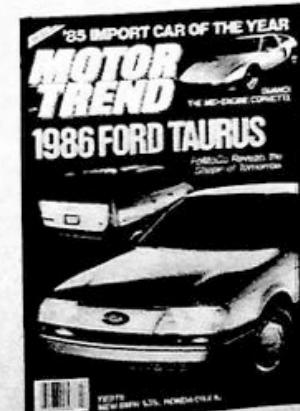
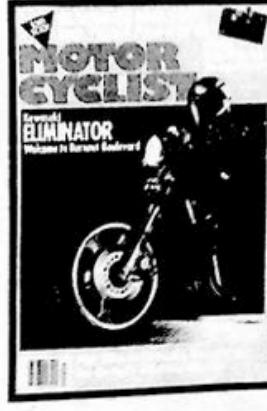
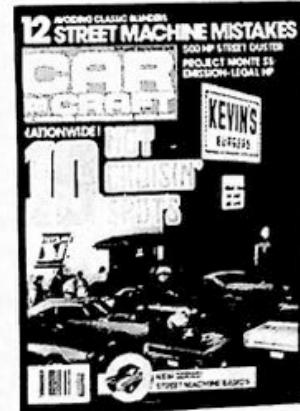
Volkswagen or Chevette four-cylinder and all applicable transmissions.

**Suspension:**

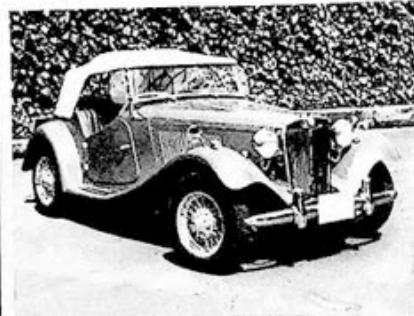
Volkswagen front and rear. The front-engine model utilizes independent Mustang II/Pinto with

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# MG-TD buyers' guide



rack and pinion steering. Chevette rear axle. Disc brakes front, drums rear.

**Body:**  
Fiberglass with double-wall construction. All hinge and latch points reinforced. Comes in your choice of gel-coat colors.

**SPECIFICATIONS:**  
Length ..... 154 inches  
Width ..... 59 inches  
Height ..... 54 inches  
Wheelbase ..... 94 inches  
Track, F/R ..... 49/49 inches  
Weight ..... 1900 pounds  
Price ..... \$6995  
Information package \$2



**CLASSICALLY YOURS AUTOMOBILES, LTD.**  
1051-A Pape Ave.  
Toronto, Ontario  
Canada, M4K 3W3  
(416) 421-8897

**Purchase Information:**  
MG-TD replica. Complete turn-key cars only.

**Construction Details:**  
Based on an unshortened Volkswagen chassis.

**Powerplant:**  
Volkswagen four-cylinder and all applicable transmissions.

**Suspension:**  
Volkswagen front and rear.

**Body:**  
Hand-laid fiberglass reinforced in all crucial areas and at all hinge, latch and mounting points.

**SPECIFICATIONS:**  
Length ..... 149 inches  
Width ..... 45 inches  
Height ..... 51 inches  
Wheelbase ..... 94 inches  
Track, F/R ..... 49/49 inches  
Weight ..... 1850 pounds  
Price ..... \$11,500  
Information package free

## CORSAIR PRODUCTS

5045 State St.  
Ontario, CA 91761  
(714) 627-3116

**Purchase Information:**  
MG-TD replica. One component package available.

**Construction:**  
Body bolts onto an unshortened Volkswagen chassis.

**Powerplant:**  
Volkswagen four-cylinder and all applicable transmissions.

**Suspension:**  
Volkswagen front and rear.

**Body:**  
One-piece hand-laid fiberglass with double-wall construction. All latch, hinge and mounting points reinforced. Supplied in your choice of gel-coat colors.

**SPECIFICATIONS:**  
Length ..... 152 inches  
Width ..... 63 inches  
Height ..... 56 inches  
Wheelbase ..... 94 inches  
Track, F/R ..... 49/49 inches  
Weight ..... 1600 pounds  
Price ..... \$6995  
Information package \$5



**DAYTONA AUTOMOTIVE FIBERGLASS, INC.**  
819 Carswell Ave.  
Holly Hill, FL 32017  
(800) 874-0134

**Purchase Information:**  
MG-TD replica. Two separate component packages as well as complete turn-key cars available.

**Construction Details:**  
Body bolts onto an unshortened Volkswagen chassis. A front-engine model is available that is based on a 2x4-inch, 11-gauge rectangular

tube frame.

**Powerplant:**  
Volkswagen or Chevette four-cylinder and all applicable transmissions.

**Suspension:**  
Volkswagen front and rear. The front-engine model features independent GM, rack and pinion steering and Chevette rear axle. Disc brakes front, drums rear.

**Body:**  
Hand-laid fiberglass reinforced with steel and comes in your choice of 10 gel-coat colors.

## SPECIFICATIONS:

Length	148 inches
Width	62 inches
Height	56 inches
Wheelbase	94 inches
Track, F/R	49/49 inches
Weight	1700 pounds
Price	\$6995

Information package free



**FIBERFAB INTERNATIONAL, INC.**  
8800 W. Hwy. 7, Suite 416  
Minneapolis, MN 55426  
(800) 328-5671

**Purchase Information:**  
MG-TD replica. Two separate component packages available.

**Construction Details:**  
Bolts onto an unshortened Volkswagen chassis. A front-engine model is available that is based on a jig-welded, rectangular tubing framework.

**Powerplant:**  
Volkswagen, Pinto/Mustang II or Chevette four-cylinder and all applicable transmissions.

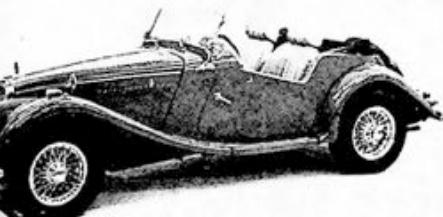
**Suspension:**  
Volkswagen front and rear. The front-engine model features independent Pinto/Mustang II, rack and pinion steering and a solid rear axle. Disc brakes front, drums rear.

**Body:**  
Hand-laminated fiberglass body reinforced at all hinge, latch and mounting points.

**SPECIFICATIONS:**  
Length ..... 146 inches  
Width ..... 59 inches  
Height ..... 52 inches

Wheelbase	94 inches
Track, F/R	49/49 inches
Weight	1900 pounds
Price	\$7495

Information package \$1



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Rochester, NY 14614  
(716) 924-7930

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MG-TD replica. Three separate component packages and complete turn-key cars available.

**Construction Details:**  
Tubular steel space frame constructed from 2 1/2-inch, 11-gauge steel tubing, similar to original MG design.

**Powerplant:**  
MGB engine and transmission. Will accept Chevy V6 and V8 engines and all applicable transmissions.

**Suspension:**  
Independent MGB front with rack and pinion steering. Solid rear axle, MGB or nine-inch Ford. Disc brakes front, drums rear.

**Body:**  
One-piece fiberglass reinforced with rock maplewood in critical areas, and at all hinge, latch and mounting points.

**SPECIFICATIONS:**  
Length ..... 147 inches  
Width ..... 60 inches  
Height ..... 52 inches  
Wheelbase ..... 94 inches  
Track, F/R ..... 49/49 inches  
Weight ..... 1650 pounds  
Price ..... \$7200  
Information package free

**VINTAGE**

**Porsche**

**550 Spyder**

*"When Chuck Beck called and asked if I'd like to drive his new Vintage 550 Spyder, I expected another 'phony' Porsche Body bolted onto a Volkswagen belly-pan. I was really not prepared for what arrived an hour or so later. The first thing I noticed was that this automobile was something special. When Chuck asked if I'd like to take it for a few 'laps' around the block, I jumped at it. The trip was more fun than I've had in twenty years. As soon as I took the wheel my mind went back to the Fifties when I drove my Porsche 550 Spyder. This car was every bit as quick and nimble as the one I raced in the Fifties. I was soon convinced that the Vintage 550 Spyder will earn its place in the hearts of sports car buffs as a fun replica—of a very famous Porsche."*

—George Follmer

We offer, along with our basic kit, a variety of optional parts packages for the Vintage 550 Spyder. We recommend their use in completing your car. The interior kit includes Speedster-type seats, door panels and kick panels, upholstered in leather-like vinyl. Tops, tonneau covers and interiors are available in black, red, or tan. Other options are: a complete windshield, complete Porsche instrument cluster, wheels, hubcaps, headlights, grills, custom exhaust system, wiring harness, switches, lights, and nameplates. Simplicity of assembly is an important factor in any kit car. This was a prime consideration in our decision to reproduce the Porsche Spyder. Because the original design was followed so closely, total assembly may be accomplished in less than 40 hours by anyone with reasonable mechanical ability. Installation of all mechanical components follows standard VW shop manual procedure. The Vintage 550 Spyder's design affords ready accessibility to all components.

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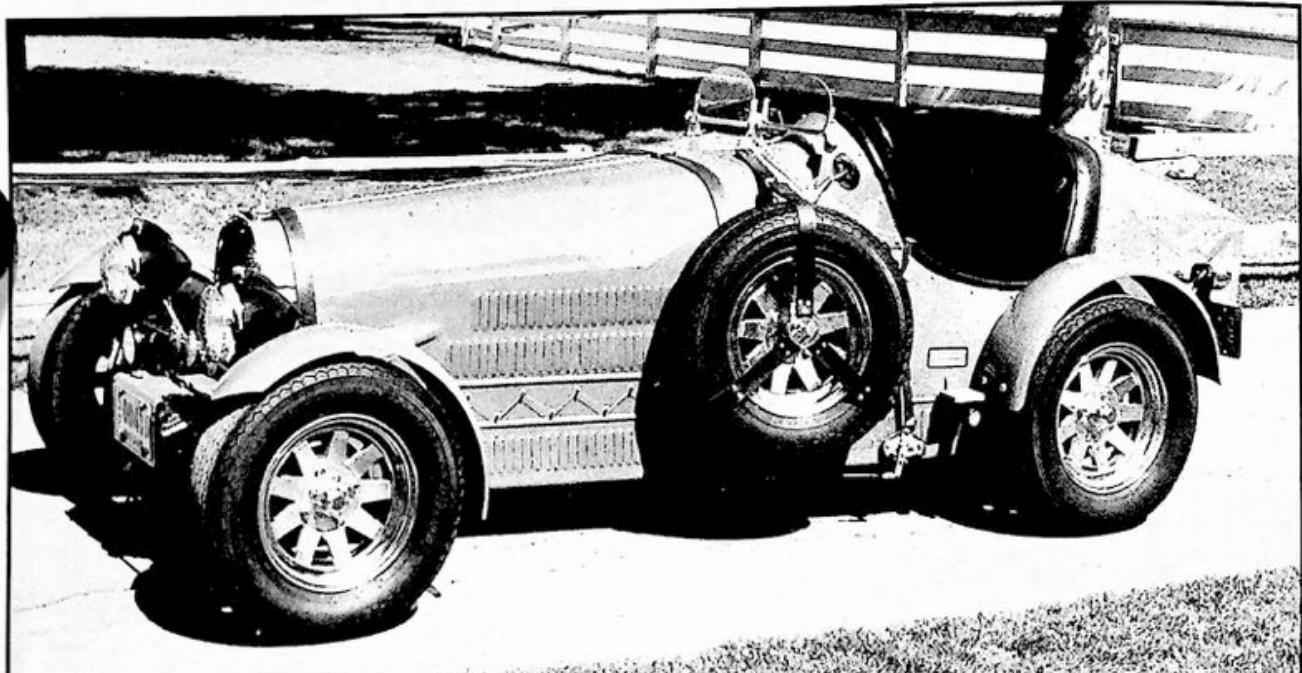


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# Fire Engine Red Screamer

THIS HOT BUGATTI WILL STOP TRAFFIC IN BOTH DIRECTIONS

By T.A. Sunderland



**A** LOT OF CARS are "fire engine red," but fire engine red is one of those exclusive hues: It usually looks best on a fire engine. Then there's Frank Hettick's Bugatti. It hits you with both barrels. Not only is it good-looking, but it has a story behind it. This is the car that started it all; the beginning of Frank's love for kit cars, a benefit for the kit car industry and the birth of Classic Instruments, Inc.

Frank was in the publishing business in the early '70s when he caught the kit car bug. He window-shopped for a time, but once he drove a Bugatti he searched no further.

"We bought the kit in 1975," recalls Frank. It was a bare bones kit. "As I remember there were two windscreens, seven pieces of fiberglass and an unchromed radiator shell. We spent four years collecting parts from swap meets and hardware stores. I had never seen a Bugatti before, but I wanted this one to look good."

While he was making plans to build his car, Frank also experimented with the gauges and dials housed in the dashboard. In the process he planted the seeds of what later became Classic Instruments, Inc. Once he discovered he could design his own gauges, Frank was on to something. Classic Instruments (2120 Maple Terr., West Linn, OR 97068) opened in 1977, and produced its first set of instruments in 1978. In fact, Classic Instruments kept Frank so busy

that he didn't get to build his Bugatti until 1979. But, most good things take a long time.

Frank uses the basic VW pan and engine combination to power his car. Because the driver sits where the rear window would normally be in a Volkswagen, Frank had to move the pedal, shifting and emergency brake assemblies back. The pan was narrowed, too. But the rest—front end and wheelbase—is unmodified.

The engine is a 1970 VW 1835cc. This little four-banger is fitted with a Holley 5200 Progressive 2V with dual-port heads. Cima hand-forged pistons absorb the shock generated by 102 horsepower and transmit it to the street. The generator and wraparound headers are chromed, and what isn't chromed is just plain pretty.

"This car is a go-getter," brags Frank. "It scares me." The car had to be registered as a show vehicle in Oregon, a different class than an "everyday car."

However, Frank drives the car almost every weekend during the summer, and several days a week he drives it to the Classic Instruments offices.

"We've never trailered the car," says Frank. "It's been in a lot of shows, but it has been driven to all of them. If we can't drive it, we don't show it."

For Frank Hettick, his classic fire engine red Bugatti is a sweet reminder of how Classic Instruments got started.

KC

# Magnum



The sports car of the future is here today, it's the MAGNUM. A totally new concept in automotive design and high-tech engineering. This limited production, handcrafted, high performance sports car combines the latest technology with classic European styling. The result: the MAGNUM, a world class sports car with handling and performance limited only by the driver's capability.

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ship for perfect sure-footed handling characteristics and lightning quick acceleration. Special resins impregnated into the hand laid fiberglass of the MAGNUM'S unibody construction ensure a permanent deep lacquer-like finish that resists deterioration or cracking. Its built-in steel reinforcing and cockpit roll cage further ensure the MAGNUM'S durability and your utmost safety.

The interior of the MAGNUM also includes a soft leather steering wheel imported from Italy, infinitely adjustable bucket seats imported from Germany as well as richly padded door panels with armrests, plush tailored carpeting, acoustically padded headliner, roll-up windows, and an extremely spacious rear luggage compartment.

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State _____	( ) _____	
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# Arizona F.I.A.



*Interior fittings are a little more comfort-oriented than original F.I.A. cockpit. Blue or black interior schemes are available. F.I.A. sidepipes are smaller than monster 427 pipes but still emit mellow notes. Full rollbar provides the driver with a nice "security blanket" without intruding on passenger space.*

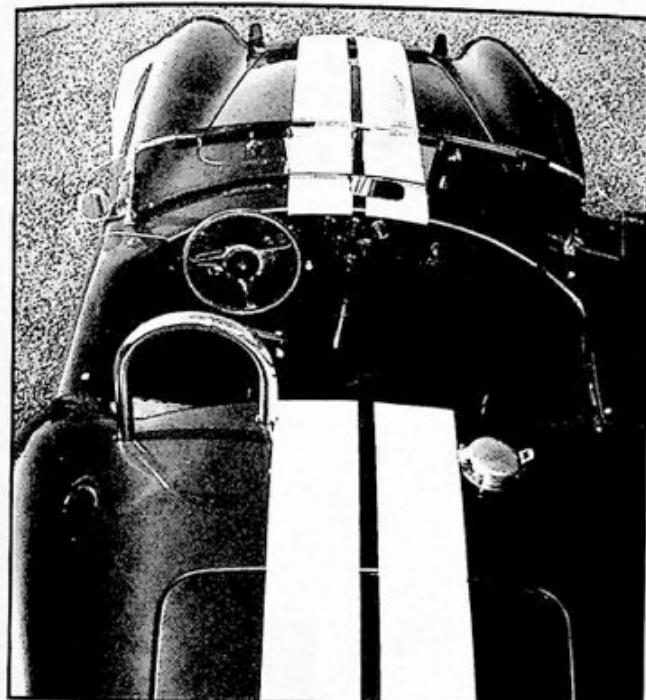


*NAF snake looks right at home in the Arizona desert. Classic 289 F.I.A. may be the most eye-pleasing of all of Carroll Shelby's creations. The white on blue Cobra may be typical, but its appearance and workmanship are outstanding. Compromotive modular wheels and Goodyear VR Gatorbacks are utilized. Notice the chrome-plated front sway bar.*

## THIS COBRA WON'T LEAVE YOU WANTING

*Text And Photography By Bob McClurg*

**F.I.A.—THREE LETTERS** that will send even the most hard-core Cobra fanatic into a frenzy. The F.I.A. and its hardtop brother, the Cobra Daytona coupe, were Carroll Shelby's ultimate small-block Cobra experiment.



According to Shelby American Automobile Club national director Richard Kopec, "The 289 F.I.A.s were really the war-horse. The Daytona coupes got all the publicity for winning the Manufacturers' World Championship for Shelby American in 1965; but if it wasn't for the F.I.A. roadsters, Shelby American wouldn't have been a contender in either the '64 or '65 Manufacturers' Series."

A total of 16 289 F.I.A. cars were built. Among those, five were made for the Manufacturers' Series, while the remaining 11 were built for the United States Road Racing Championships (USRRC). During '64-'65, 14 drivers were employed by Shelby American to pilot the F.I.A.s, but Dan Gurney, Phil Hill, Bob Bondurant and Dave MacDonald were the official factory drivers.

Stylewise, it is common knowledge that the 289 F.I.A. was the "interim model" that bridged the gap between 289 and 427 bodies. The F.I.A.s boasted front and rear fender designs that were mirrored in the big-block Cobras. Meeting Federation International Automobile (a sanctioning body formed to establish regulations and rules for the F.I.A. Cobra) tire and wheel regulations was the motivating force behind the F.I.A.'s enlarged wheel openings.

Today, fewer than a dozen of the F.I.A. cars remain and, therefore, qualify for genuine, rare-bird status among collectors. Over the past few years, a number of replications have been attempted on the F.I.A. body style. The latest, and possibly the best, was introduced by North American Fiberglass (NAF) in Tempe, Arizona.

NAF's 427 and 289 Cobra replicas have been very

successful in the kit car market, and paved the way for public acceptance of an F.I.A. replica. According to NAF's Jack Kube, "The 289 F.I.A. is one of the nicest-looking cars Shelby American ever produced. We've thoroughly researched this car prior to production, and we think you'll agree that we did our homework."

NAF has taken the "you can have any color as long as it's black" attitude in selling its new F.I.A. replica. In other words, this car will not be sold in kit form. Instead it will be sold in semi-completed and turn-key stages only, with a price tag of \$20,000 to \$28,000, respectively. The reason for this decision is NAF feels that an F.I.A. should be built only one way, which is exactly the way the cars were built when Shelby American won the championship.

The good news is, however, that certain non-competing options will be available. These include a heater, air conditioner, rear anti-sway bar, competition oil cooler, twin fans, racing fuel cell, a hardtop with sliding side windows, and a Tilton mechanical brake bias. All will be offered as "factory-blessed" items for your F.I.A.

The chassis on the F.I.A. replica differs from the original's for safety reasons. The replica is built of 2x4-inch tubing in a ladder configuration. Suspension is an eight-inch Ford live axle in back using a five-bar link setup with Aldan coil-over shock absorbers. Gearing is 3.25:1. Up front, NAF uses a set of Mustang II spindles and upper and lower control arms, which have been modified to accept the Aldan coil-over shocks. An NAF 3/4-inch anti-sway bar is also standard equipment.

Tilton Engineering disc brakes are used on all four corners (10 1/2-inch Lincoln discs and '85 Corvette calipers), along with a Tilton emergency disc brake mounted to the front of the differential. Wheels and tires on the car pictured are eight-inch-wide Compomotive aluminum modules equipped with VR-50 Goodyear Gatorbacks. Street versions on turn-key 289 F.I.A.s will be equipped with B.F. Goodrich (P-225/R60x15 front and P-245/R60x15 rear) radial T/A rubber.

NAF offers such complete pallet 289 F.I.A.s that the customer only needs to install the wheels, tires, engine, transmission, driveshaft and radiator. But the really good news is for buyers purchasing a turn-key F.I.A. North American sells this version with a fully warranted, 1985 1/2 5-liter H.O. 302 Ford small-block, backed up by a Borg-Warner H.E. T-5 five-speed and 10-inch clutch.

NAF builds its F.I.A. bodies using triple-thickness, hand-laid fiberglass for a strong, smooth shell. Several colors are available, but this particular model was painted in the traditional guardsman blue with white stripes.

Inside, you'll see that F.I.A. instrumentation, seats and rollbar are exact, with interior colors in either black or blue.

Overall, this is one replica of an F.I.A. that deserves to be compared to the original. It leaves you breathless and wishing that you owned one. The best part is that you can have one of your very own. North American Fiberglass' F.I.A. is an exotic car, but with an affordable price.

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80 KIT CAR

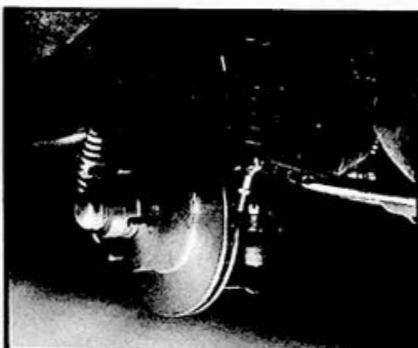
## Arizona F.I.A.



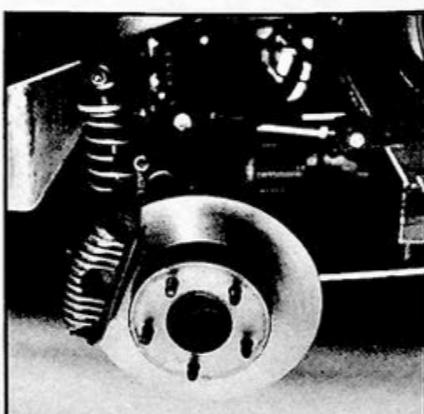
Even Cobras have to rest some time. The addition of the F.I.A. model to North American's production line should produce more Cobra enthusiasts.



Full-fendered wheelwell openings are filled to capacity with P225/R60x15 Goodyears mounted on 15x8-inch wheels. Rear axle wears P245s. Notice the beautiful aluminum grillework in side fender vents.



Front suspension consists of Ford components and a few minor tweaks and modifications to retain original F.I.A.'s handling reputation. Disc brakes are a must. The chrome-plated adjustable sway bar is rare for Cobra replicas.



In back, Ford nine-inch is supported by four-bar-type suspension and coil-over shocks. Rear-mounted disc brakes provide extra stopping power. KC

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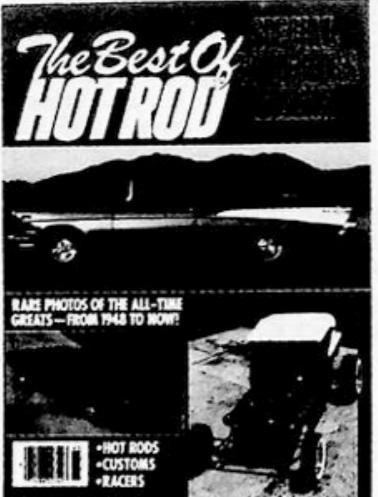
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# SAMA NEWS

## '86 KIT CAR NATIONALS



I want to buy a complete car and drive it home. Can you guys give me the name of some dealers in New York?" asked the caller to the SAMA office.

grounds for test drives, and many manufacturers will have cars on hand for prospective buyers to drive.

SAMA anticipates strong supplier representation of parts and accessories such as shocks, wheels and gauges. Many of these will be at special Kit Car Nationals' prices, and so will kits and complete cars. Nationals' "specials" are commonplace. So for those enthusiasts looking for their dream kit, this is the time to buy.

### KIT CAR NATIONALS SCHEDULE

Friday, July 4, 6-11 p.m.  
Saturday, July 5, 10 a.m.-10 p.m.  
Sunday, July 6, 10 a.m.-6 p.m.

Columbus is in the hub of specialty automotive activity, but the location is not as convenient as association officials would like. A West Coast SAMA mini-nationals will soon be announced that will probably be held in the Los Angeles area.

There's a demand for a series of kit car events in various locations such as Florida, the East Coast and Los Angeles, and SAMA intends to fill the voids by producing "mini-nats" events to supplement the annual Kit Car Nationals.

This year's event should attract even more car manufacturers (there were 40 in the '85 event in Detroit), along with a substantial number of accessory vendors. The SAMA office is projecting 60 kit car and complete car companies, and 60 parts and equipment vendors.

Private car owners are urged to enter the Kit Car Nationals and be a part of this exciting, once-a-year show. An entry form on the following page is included for your convenience. Manufacturers, on the other hand, should contact the SAMA offices for space information. Write to: SAMA Kit Car Nationals, 4340 Campus Dr., Suite 202, Newport Beach, CA 92660, (714) 756-9053. **KC**

# KIT CAR NATIONALS

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**GALA FOURTH OF JULY WEEKEND CELEBRATION**  
COLUMBUS FAIRGROUNDS, COLUMBUS, OHIO, JULY 4, 5, 6, 1986

## OFFICIAL ENTRY FORM

Entry forms required for all participating cars! Complete this form and mail in with a photograph (a snapshot will do) of your car, along with the correct entry fee (see below). An official entry number will be furnished along with a letter of confirmation. Only kit cars and replicars eligible for participation in the Kit Car Nationals (no other cars admitted to the fairgrounds). Entry must be received no later than June 1, 1986; earliest entrants receive the lowest registration numbers.

Name \_\_\_\_\_ Age \_\_\_\_\_ Wife's name \_\_\_\_\_

Street address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Describe your car (make, model, year built, etc.) \_\_\_\_\_

Club affiliation, if any \_\_\_\_\_

Competition preferences (for judging):  Best Engine:  Best Paint:  Best Interior:  Best Engineered

**GENERAL INFORMATION:** The third annual Kit Car Nationals will be produced by the Specialty Automotive Manufacturers Association (SAMA) at the Ohio Expositions Center Fairgrounds in Columbus, Ohio, July 4, 5 and 6. Registration begins Thursday morning, July 3, at the fairgrounds, and continues through Saturday, July 5. All admission credentials, vehicle identification sticker and related registration materials available for pick up only at the registration center at the Fairgrounds. Vehicles without windshield sticker in place not admitted to fairgrounds. Proper credentials must be shown by individuals for admission to fairgrounds (two admission credentials included with each entry).

**ENTRY & ADVERTISING RELEASE:** Car owner and wife or guests, in consideration of this entry, agree to permit the Specialty Automotive Manufacturers Association and/or Kit Car Nationals the use of their names and pictures, or pictures of their car(s), for publicity, advertising and commercial purposes before, during and after the Kit Car Nationals, and hereby relinquish any rights whatsoever to any photos taken in connection with the event, and give permission to publish, sell or otherwise dispose of such photographs to the Specialty Automotive Manufacturers Association.

**ENTRY FEE:** SAMA members enclose \$20 for car entry and admission credentials for two adults to all Kit Car Nationals events and activities. Non-SAMA members enclose \$35 for a 1-year membership in the Specialty Automotive Manufacturers Association (SAMA) and car entry and admission for two adults to all Kit Car Nationals events and activities (optional). Children under 16 years of age admitted free if accompanied by an adult. All participant materials — windshield sticker and admission credentials — will be available only at the Kit Car Nationals registration center at the Michigan State Fairgrounds prior to and during event, upon presentation of your confirmation letter (furnished by return mail).

Total fee enclosed with this entry: \$ \_\_\_\_\_ (\$20 for Kit Car Nationals entry only. Optional: \$35 for non-SAMA members, includes one year's membership and Kit Car Nationals entry).

I have read the foregoing conditions of the Kit Car Nationals and agree to observe all rules and decisions set forth by event officials.

SIGNATURE OF ENTRANT (must be signed): \_\_\_\_\_



Produced exclusively by:

MAIL THIS ENTRY FORM TO:  
**KIT CAR NATIONALS**

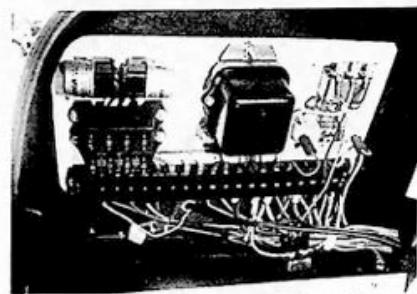
4340 Campus Dr., Suite 202, Newport Beach, Calif. 92660  
714/756-9053



# Part 1



The majority of kit cars sold come with a manufacturer-supplied wiring harness. Although a lot of the work has been done for you, you still should understand the basics in order to ensure a proper installation and trouble-free operation.



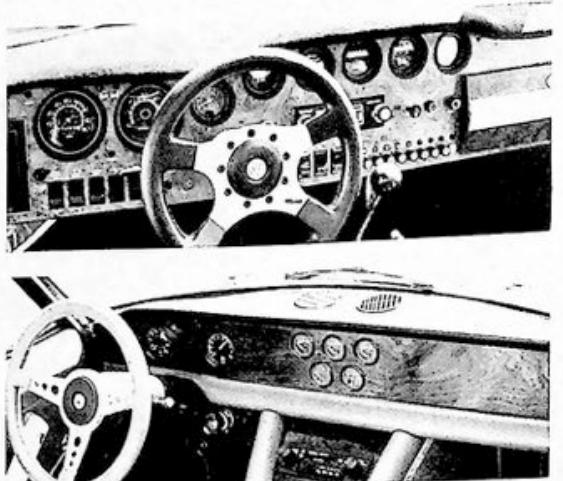
A custom electrical panel like this one looks trick and will likely lead to a reliable system. It also shows that the builder put a lot of planning into his project. The panel's design should make maintenance easy.



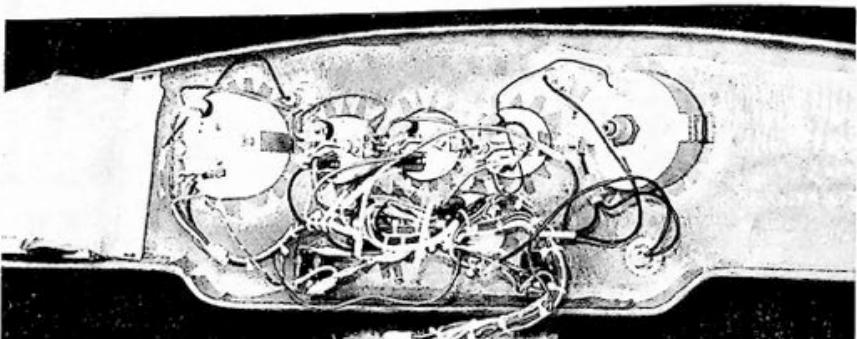
The P.C.C. master control panel mounts to the firewall under the dash. The separate wire harnesses are bundled together and are ready to be routed to their proper locations. Be sure to position them away from any heat source.

time you hit the brakes. Once you've got a coherent wiring diagram, DO NOT approach the vehicle with a roll of wire in one hand and a box of connectors in the other. You cannot string wires one at a time and be successful.

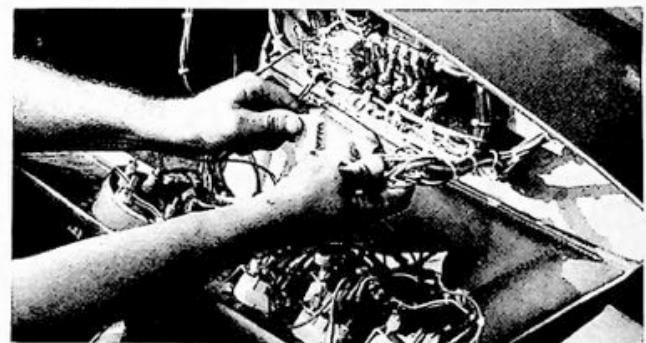
• You must look at the diagram, count how many wires there are in each part of the system, measure the distances involved from one component to another, then create the harness outside the car (leaving a few feet of extra wire at every end for good measure). Separate parts of the



Automotive electrical systems run the gamut from elementary to the most complex. The complex systems require more work and material but both systems can be handled with the proper planning.



The Pacific Coast Cobra 289 F.I.A. replica has a manufacturer-supplied electrical system. The harness comes ready to install and has lots of features that will allow it to function without fail for many years. The dashboard has all of the necessary gauges and lots of tie wraps along with a quick connector.



Simply plug the dashboard harness into the master control panel connector and you are ready to go. If you have followed the directions carefully, you will be rewarded with many miles of driving pleasure.

harness will include wires for dashboard to engine, dashboard to rear lights, and dashboard to front lights. The forward section will include wires for the horn, headlights, parking lights, turn signals, fog lights, and maybe a wire to the fuel gauge if the tank is in the front. The rear section will include wires for the taillights, turn signals, brake lights, license plate light, backup lights (maybe), and a fuel tank sending unit wire if the tank is in the rear. The harness from the dashboard area will include the ignition wire, gauge sending units, charging system,

starting system, and the main power wire from the battery to the switches.

• As you begin fabricating the harness, be sure to write the colors of the wire you're using on the wiring diagram. Use tie wraps or tape to section off the wires that go with each part of the system, and make sure all the wires are secured in their relative positions in the harness before you attempt to install them in the vehicle. Nothing will throw a monkey wrench in the works faster than having a floating wire you can't account for.

• Once the harness is laid out and

secured, install the main bundle of wires and hold them in place with tie wraps, D-clamps, or however you plan to locate the harness so it doesn't move around.

• After the main part of the harness is cinched down, take each of the separate wire systems (dashboard to engine, dashboard to front, dashboard to rear) and, referring to your diagram, route each wire exactly to its intended terminal. To save on the cost of tie wraps, you might want to locate the wires with a small strip of tape until you've got everything laid out just the way you want it. Once the wires are in place, you can give the system a finished, professional look by purchasing (at any neighborhood auto parts store) a package of flexible, corrugated tubing with an opening so you can fit it around wiring that is already in place.

• After you've done all this work, it will be worthless unless you've used the appropriate wire gauge for each circuit. So take heed of the following recommendations. For the main power feed to the dashboard from the battery, and for the charging system line from the alternator or generator, use 10-gauge wire. For headlights, windshield wipers, fog lamps, or any other continuously used circuit that has a fairly heavy current drain, use 14-gauge wire. And for all other circuits, the dashboard lights, brake lights and turn signals, 16-gauge wire is recommended.

• The important thing to remember about wire gauges is that the higher the number, the smaller the wire. Installing too small a wire will result in the circuit running hotter than it should, which causes premature switch and/or fuse failure. It's also a good idea to use as few connectors in a wire as you can. Every time the flow of current is interrupted by a connector (be it a crimp or even a soldered joint), there will be some measure of resistance. If there are several of these in the course of a long wire from the dashboard back to the engine compartment, a distinct (and problem-causing) drop in voltage can occur. A severe drop and the system will never work properly. It will be susceptible to changes in temperature, such as when the engine compartment heats up.

These tips should be helpful when you begin planning your own wiring system. But what if you're more fortunate than I was, and don't need to completely rewire the car? What if you have a couple of wires dangling from the steering column and can't figure out how to hook them up to make the turn signals work?

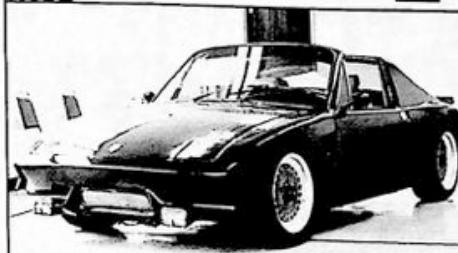
These are the sort of problems that Mark Hamilton is a wizard at, and will be addressing in future issues. So stay tuned, or haul your car to Mark's shop along with your checkbook. The arcane art of electrical wiring is not easily come by, nor practiced for free.

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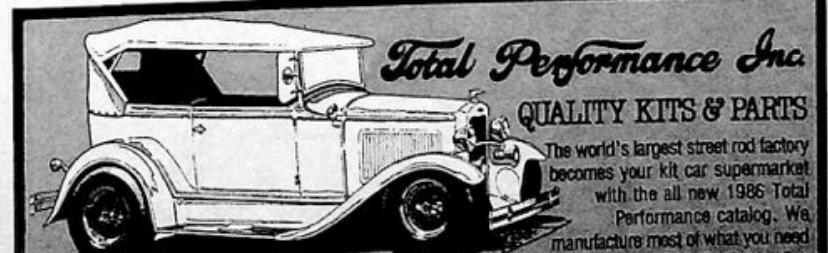
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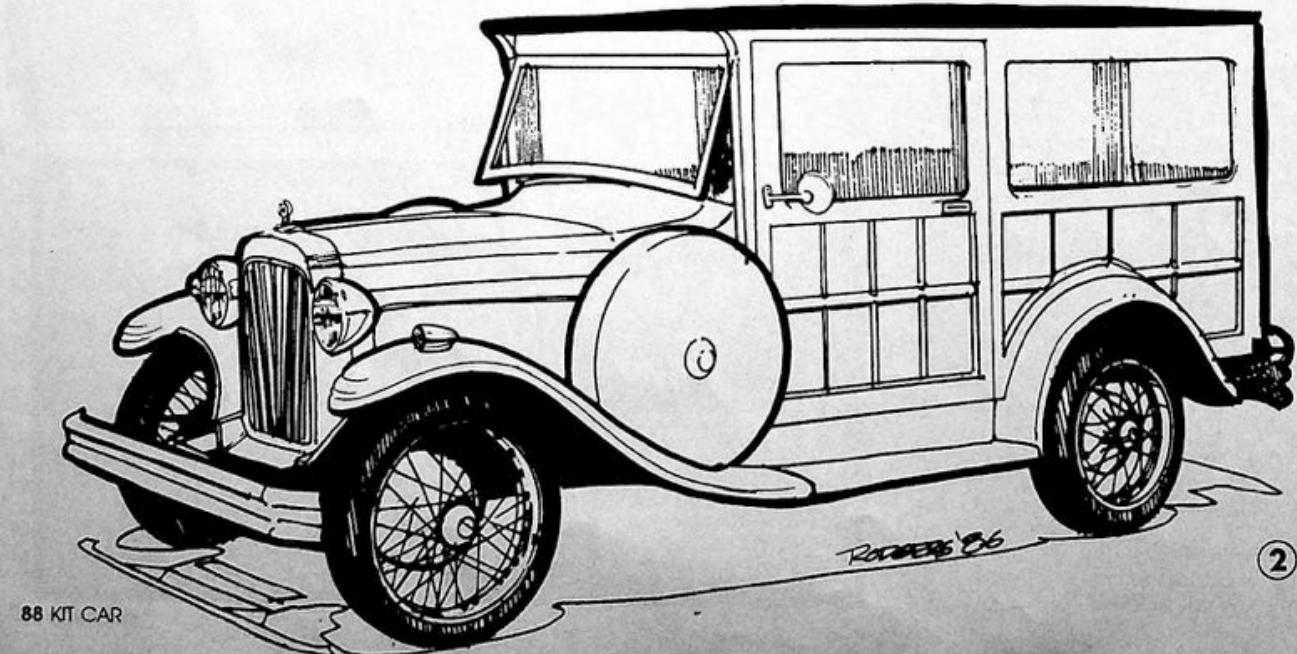
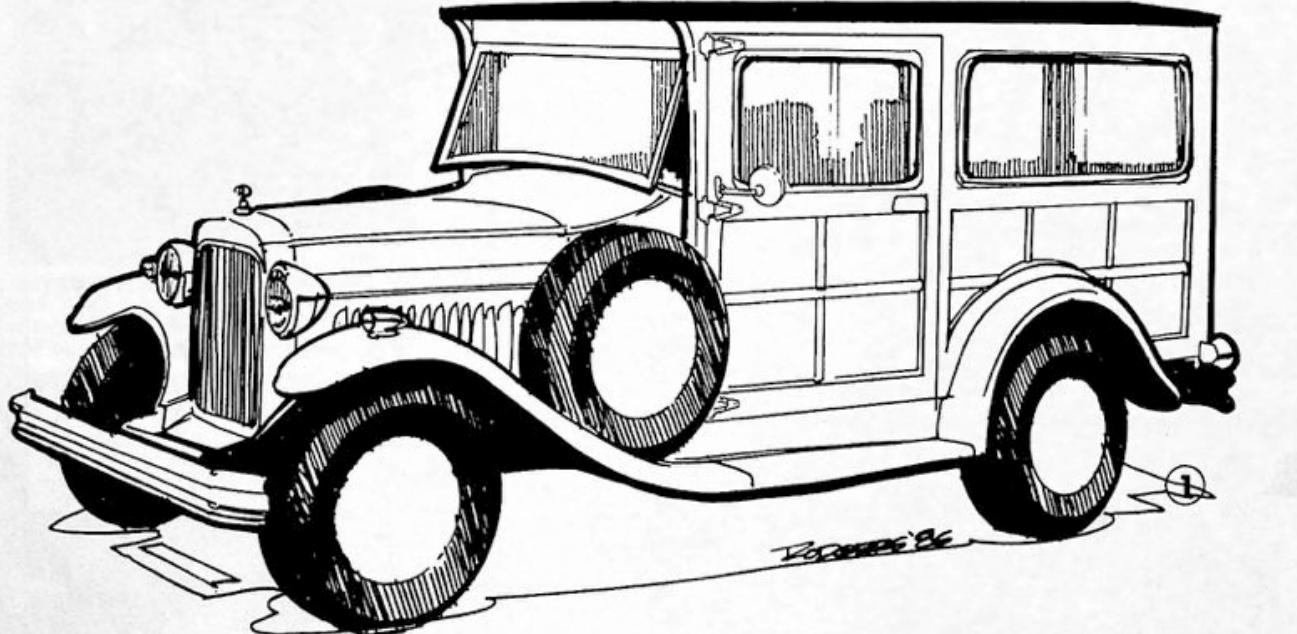
## KNOCK ON WOOD

By Lawrence D. Rodgers

Classic Woodies have long been a favorite among auto enthusiasts. That's probably because their beautiful bodywork conjures up fond memories of days gone by; days when almost all automobiles incorporated some kind of wood in their makeup. Woodies seem to have universal appeal, from the antique car crowd to surfers. Kit car enthusiasts have jumped on the Woody bandwagon as well, and it is currently being reproduced by Legendary Motorcars (P.O. Box 292434, Columbus, OH 43229) and Verco, Inc. (227 W. Main, Greensburg, IN 47240).

Our artist's renderings improve the traditional Woody shape with a number of lavish styling treatments. The Woody's square, boxy shape lends itself easily to restyling, therefore ideas and modifications are limited only by your imagination and pocketbook. **KC**

**Editor's Note:** The Woody reproduction, as offered by the above mentioned manufacturers, does not come with the styling treatments depicted on these pages. These images are our artist's conceptions only.



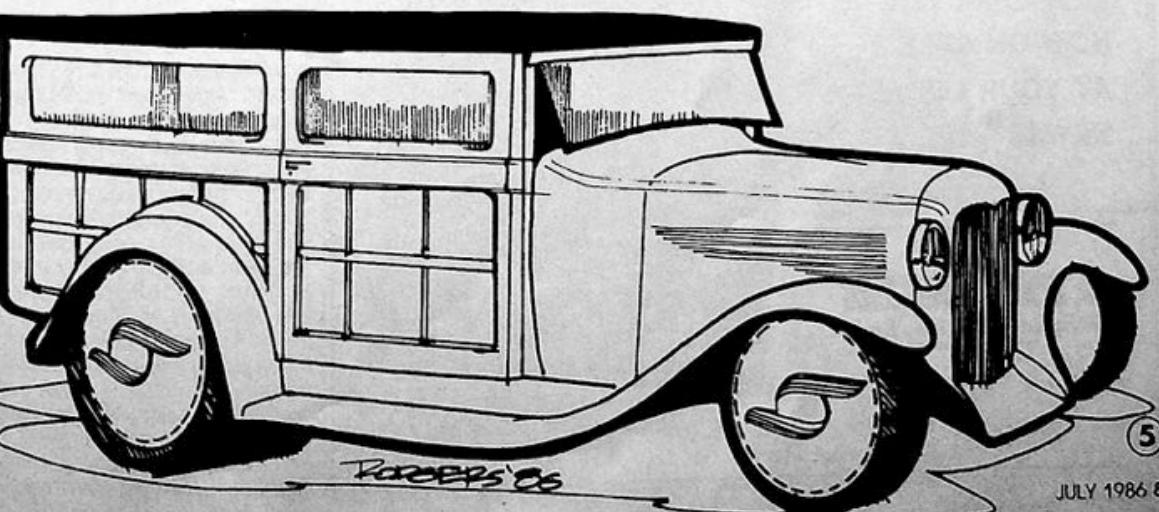
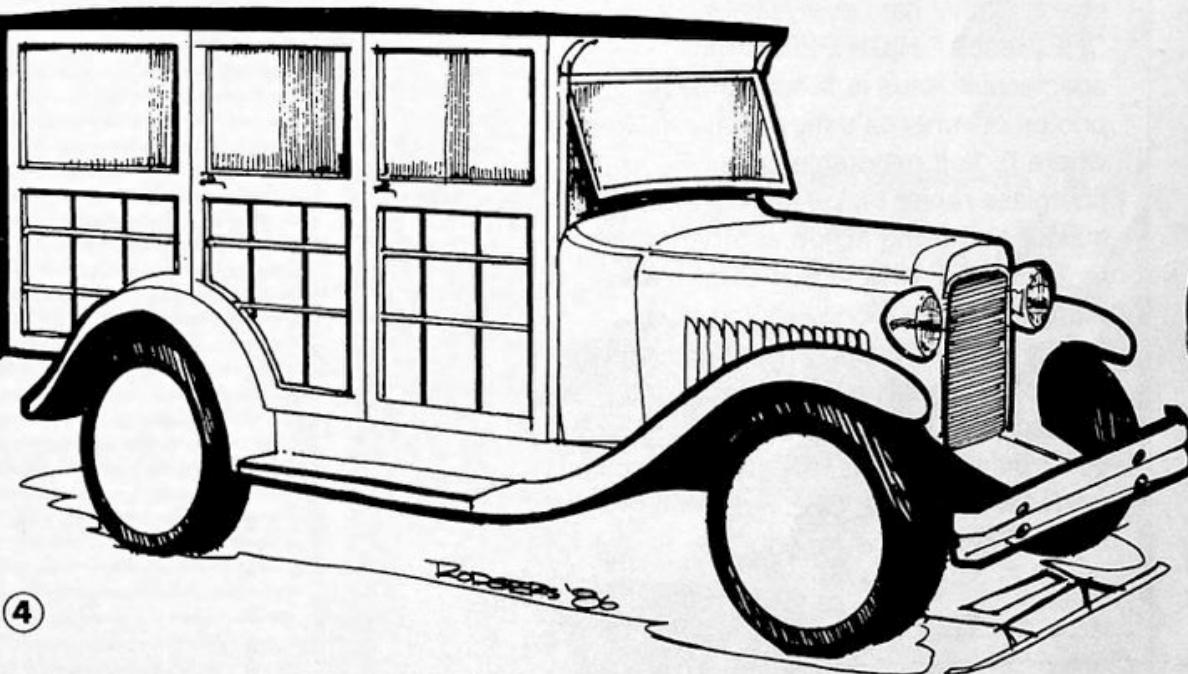
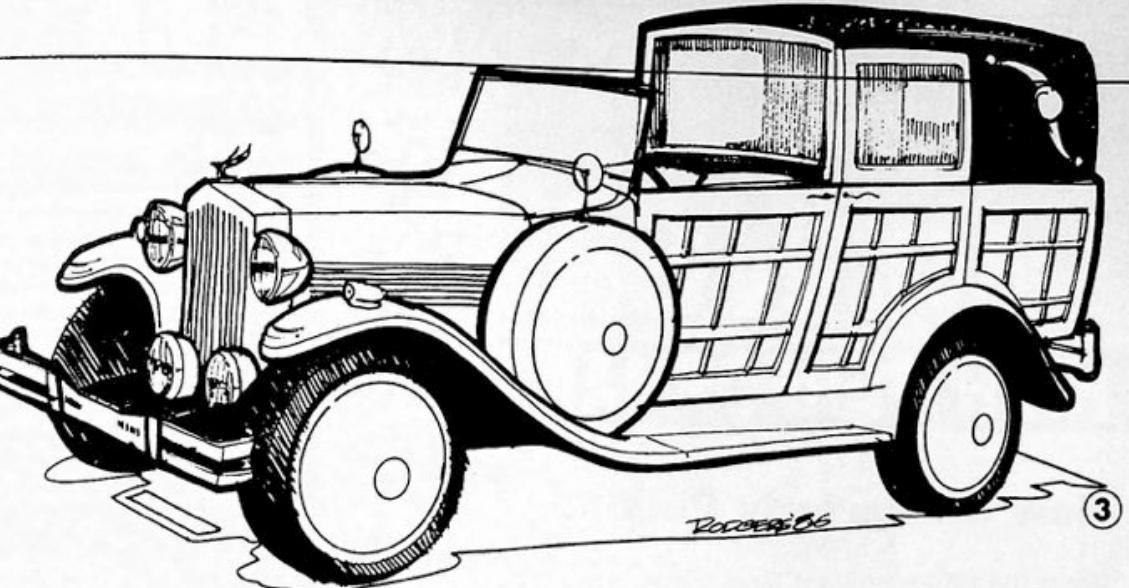
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**2 More traditional look: '50s-style wire wheels, covered spare, windows corrected.**

**3 Woody Town Car; for the ultra-rich surfer.**

**4 Stretched body. Cowl moved forward to create four-door style.**

**5 "Pro Street" Woody with chopped top and monster motor.**



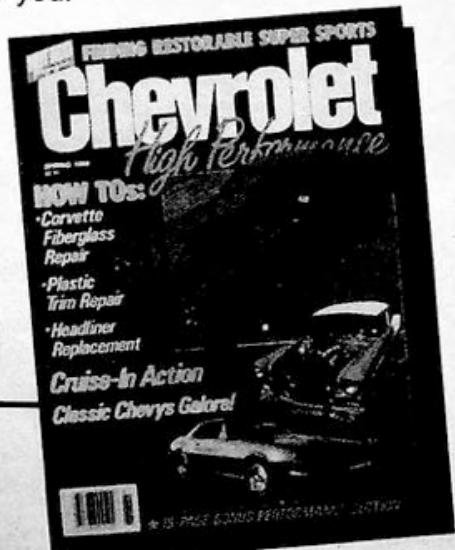
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## TECH Q&A

By Brett MacDonald

### BUILDER STRESS

I am having a problem with my Kellison GT-40 replica that I hope you can help me with. The rear deck is quite thin and has numerous stress cracks in it. I went to a local body shop and they wanted to add layers of fiberglass to the inside and then cover the outside with body filler. I do not feel that this would be an effective repair and that it would make the tail section too heavy. Do you have any suggestions?

Nick Eggenberger  
Greely, PA

Currently, kit car manufacturers are using a product known as *Core-mat*® during the original layup to provide stiffness without significantly increasing body weight. As this product was unavailable in the late Sixties when your kit was produced, you now have two courses of action that should solve your problem. First, you could add a layer of *Core-mat*®, but because you would probably have to buy a large roll, it would not be economical for your repair. Your other alternative is to install a stiffening grid inside the tail section. This should run from the rear hinge area to the forward edge with supports around the window, too.

To fabricate the grid, start with some thin cardboard tubes about three feet long. They don't have to be very thick because their sole purpose is to support the fiberglass while it's curing. Cut these tubes in half (lengthwise) to form a U-shaped channel. Mark the location of the supports in the body and grind an area approximately three inches wider to provide a good surface for the fiberglass to adhere. Finally, tape the channels in position and fiberglass them, overlapping the edges about one inch. Once the fiberglass has cured, you will find that the tail section is a lot stiffer with only a slight increase in weight (about four to 10 pounds).

There are several ways to repair your car's stress cracks. You can perform one of them at home, but the other tricks should be left to a professional who has extensive experience in gel-coat application. (Some of these methods require the entire car to be recoated, then sanded and buffed to achieve a satisfactory finish.) Your best approach is to block sand the areas of stress, removing all the paint and then apply a sprayable filler. Next, refinish the entire car with a two-part mixture of polyester primer and paint. A note of caution: Don't use any paint, especially catalyzed epoxy paints, without adequate ventilation and a high-quality respirator. Many health problems can be caused by breathing paint fumes and most epoxy-type paints contain isocyanate, which can be deadly.

### SIX PACK TO GO

I've wanted to build the Aquila from American Fibre Craft ever since I first saw it in *KIT CAR*. I want to build my car around a Corvair engine that I have, but when I contacted Kennedy Engineering Products about an adapter for Corvair to VW, they told me that I must also install a reverse-grind camshaft to make the engine rotate in the same direction as the VW engine that I would be replacing. I also plan to use a Porsche 914 transaxle, disc brakes and rack and pinion steering. Since the Porsche is a mid-engine car and the Aquila is rear-engine, wouldn't the transmission work properly in this application without the reverse-grind cam? Also, what other problems might I encounter in building my Aquila using the parts I've mentioned?

John S. DuRette  
Hampton, VA

We doubt that you would be happy if you put a Corvair engine in your kit. First, you would have to add a brace to the rear of the frame to support the heavier Corvair engine. Then you would probably have to modify the rear body section to accommodate the increased engine length. And finally, none of your friends would let you park your car in their driveways unless you brought along an oil drip pan.

While the transaxle would work as you perceive, you would encounter an accelerated wear rate of the ring and pinion gears that would be unacceptable as these gears are designed to take loading in a specific direction for improved wear and power transmitting ability.

It would be nice to use the Porsche suspension and brakes you suggest, but you will encounter major adapting problems as the 914 uses a MacPherson strut suspension system and the kit you want to build is set up for Volkswagen Type I components front and rear. Your best choice, both from an economic and construction standpoint, would be to use a Karmann Ghia disc brake front end and disc brake conversion kit for the rear like the one offered by Gary's VW Specialties, 8301 Standustrial, Stanton, CA 90608. It would not be advantageous to go to the trouble of adapting a rack and pinion steering unit as the stock VW box is an excellent piece of equipment.

### FORDRARII

I am building an Alpha 1 GTO and I want to replace the stock Datsun six-cylinder engine with a V8. I prefer the Ford small-block over the Chevrolet due to its slightly smaller size and lighter placement (at the front where it's easy to



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### TECH Q & A

work on). Do you know of any company that makes a kit to install the Ford motor in my 1973 240Z?

Jon Koederitz  
Gretna, LA

Some years ago we saw a kit offered for just such a swap, but we have been unable to locate anyone who remembers what company offered it or where they were located. This swap is simple and you can fabricate the mounts yourself or take patterns of the mounts to a welder or machine shop and have them reproduced.

The first step in your swap should be to visit a local junkyard and locate the motor mount that will best suit your needs. We suspect that the mounts from a 1974-'78 V8 Mustang II will do just fine. After locating the mount you want to use, purchase new ones but don't forget to get one for the transmission, too. Install the new engine and trans mounts and lower the motor into your chassis. Test mount the exhaust manifolds, air cleaner and other accessories on the engine to make certain that they will clear the car's hood. If the oil pan sump is in the wrong place, you can scavenge an oil pan and pickup tube from an early Bronco with a V8, since the sump is located in the rear for this application.

Once you have the engine safely blocked in the proper location and you are certain that there is enough room to hook up the exhaust without interfering with the steering, you can begin to make your frame mounts. You will need some stiff cardboard and a hot-melt glue gun. You can use regular glue, but you will find that the speed with which the hot glue dries is an advantage. Cut the cardboard into the general shape of the mount that you need, making certain there is enough extra material to allow for a final trim to the exact dimensions that your engine requires.

Make two sets of mounts and use the glue gun to assemble one set. Install this set and check that all dimensions are correct. Afterwards, take both sets to a machine shop or welder and have him use the unassembled set as a pattern. Cut your mounts from quarter-inch steel plate and then weld them together using your assembled mount as a guide. All that's left for you now is to install them in your car's frame.

### LAMBO LOVER

I love exotic-type kit cars and would like to build my own frame and use the Countach body that I have seen advertised in your magazine. I have read articles that talk of using a Toronado transaxle and others that recommend a Corvair or Porsche. These articles, however, don't mention the type of rear suspension or where the parts came from. I

would like to know what parts to use and since the ad mentions that the kit does not include glass, where can I obtain a windshield if I decide to build this car?

Dennis Davis  
Church Hill, TN

Yours is certainly an ambitious project. To start with, you will have to set down some basic dimensions. Because the Lamborghini body is quite wide, we think that you will have to build your own suspension arms for the car. We don't think that the Toronado transaxle would be a very good choice for this car as it locates the engine too high and would protrude through the car's engine cover. Your best choice would be the Porsche 915. It is strong and adapters are available to mount a Chevrolet V8 to it.

Once you've worked out the body dimensions and have the motor and trans placed in their proper locations, it will be possible for you to design the suspension. Place the tires, wheels and hubs in their proper locations and construct control arms to connect them to the chassis. You must keep in mind, however, that the wheels will tend to toe in or out through their travel if you don't design the suspension properly, which could create an ill-handling and unsafe car.

To help you get your project off on the right foot, you should consider attending a Sports Car Club of America race and examine the various suspension designs in use there and find one that will fit your car. One car to pay special attention to is the Sports Renault. It uses stock Alliance parts and handles extremely well. The Alliance also uses the right rear suspension on the left front, and vice versa. This concept reduces the number of spare parts that a racer must carry, but you can use it to cut your design time in half. We also think that someone could use the entire drivetrain from the Sports Renault in a kit and have a very nice, compact and reliable package.

Obtaining DOT (Department of Transportation)-approved glass is not a problem. You merely go to your local Lamborghini dealer and have him order the glass for you. We imagine that it would be a \$1200 experience to buy the windshield (\$800 for the glass and \$400 for shipping and customs duty). **KC**

Send your technical queries to:  
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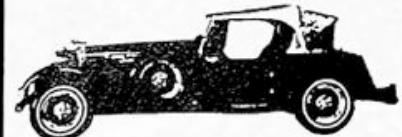
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# K.C.R EGISTRATION

## MICHIGAN

As with all other states, kit cars have to be inspected before they can be registered in Michigan. Inspection must be completed before the Office of Driver and Vehicle Services will even begin the registration and title process.

In order to arrange for an inspection, go to your local Office of Driver and Vehicle Services branch and obtain an inspection form. Take this form, the Certificate of Vehicle Inspection by a Police Officer (Form #TR 54), to the law enforcement agency. This inspection serves a dual purpose. The officer will check the car to see that it is roadworthy, as well as inspect and verify the numbers on the engine and frame. After the inspection is completed, the officer will fill out his portion of the form.

The next stop is the weighmaster. He will weigh your car and issue a weight receipt. Then return to the Office of Driver and Vehicle Services, and bring both the weight certificate and the TR 54 form, and also all other paperwork and receipts for the rest of the car.

According to Len Miller of the Bureau of Field Services Information Center,

Michigan has tightened down on its requirements. You must present the Manufacturer's Statement of Origin for the kit and the title for the frame or engine used. You will also need a bill of sale for the following items: engine, transmission, and all body parts.

The ownership document or bill of sale must include the name of the owner or the name and address of the person who assembled the vehicle, the date of purchase and a description of the parts and their prices. All serial numbers must be shown on the bill of sale. Finally, you need the name, address and phone number of the parts dealer or the person who sold the parts.

Michigan is a state governed by compulsory insurance. This means when you apply for the registration you have to submit proof of insurance before the registration and title will be issued. This is done with a Michigan Certificate of Insurance, obtainable from your insurance

agency.

The fees you will need to pay on the vehicle include a Value-Added Tax—a tax on the value of a vehicle. This tax will vary, of course, with each individual case. According to Miller, the tax on a vehicle valued at \$10,000 is \$53. This is a prorated fee, payable yearly on your birthdate. If you register between birthdays, you will pay the remainder of that year's fee, and an additional year's fee if the date is less than six months before your birthday.

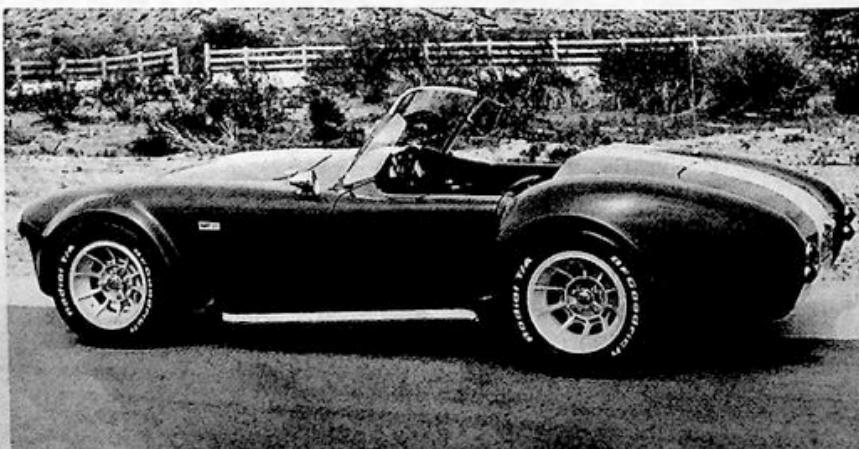
Michigan has a sales tax of 4 percent, which has to be paid on all components of the car unless you can show proof in the form of receipts that this sales tax was paid when you purchased the kit.

Finally, there is a \$2 title fee and a \$2 fee for a new VIN (vehicle identification number). When you title an assembled vehicle in Michigan, you will be concurrently applying for a vehicle number. This is a replacement VIN, which will be recognized as the VIN for the new car. The new VIN is computer-generated at a branch office and will appear on your registration.

You will receive your assigned number and title at the Office of Driver and Vehicle Services. However, it will take a few weeks for your VIN plate to arrive from Lansing. In the meantime, you are allowed to drive the vehicle on a 14-day permit, which costs \$5. You'll receive your license plates after you get the VIN plate.

When you drive your vehicle to the law enforcement agency for inspection, before it is registered, you are covered by law. Michigan allows you to drive on the streets "only by the most direct routes to those facilities."

All these procedures for kit car registration are listed on the Michigan Department of State form BFS-72. Any additional information you need concerning this can be obtained by writing to: Office of Driver and Vehicle Services, Michigan Department of State, Lansing, MI 48918, Attn: Inspector's Office; or call (517) 322-1528. **KC**



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